Dear Valued Employee:

As part of our mission to create and maintain a safe work environment, our “Safety & Loss Control Program” has been developed. The program is designed to be both an educational reference and a directive; enabling us to comply with the law and understand the basis of regulatory issues.

A great deal of this written program are common loss control issues and areas of concern that continue to be brought up corporate wide. Each chapter focuses on the essential elements of a strong safety program such as formal training and communication, worker’s compensation, safe work habits and job hazard analysis, administrative procedures and delegation of responsibility in each of these areas.

We believe that a safe operation not only prevents unfortunate injuries but facilitates quality and efficiency in our operations. It is our sincere hope that your job with us and the environment you work in is a safe one. We welcome your suggestions (jwoodings@triangleservices.com) and offer any support we can provide in this area.

Sincerely,

TRIANGLE SERVICES INC.

Lonnie Fine

President/CEO

TRIANGLE SERVICES CORPORATE SAFETY MANUAL

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Policy Number: SP001
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

General Safety Policy Statement

Purpose:

State the general safety policy of Triangle Services, Inc.

Applicability:

All employees

Procedure:

Triangle Services and its affiliated companies are committed to providing a safe workplace for our employees, customers, and the communities we work in as set forth by the Occupational Safety and Health Administration's (OSHA) Act of 1970, local, state, and industry regulations. Ultimately, we strive for a work environment where good safety practice is implanted in the minds of our employees.

The following general safety policy statements are applicable to all divisions within Triangle Services and its affiliated companies. Policy statements that apply to specific safety topics can be found in the Safety Topics section of this manual.

1. Operating procedures will be analyzed prior to implementation to identify and eliminate safety and health hazards for our employees, our customer's employees and the surrounding community and develop appropriate training programs.
2. Where safety hazards cannot be eliminated, personal protective equipment will be provided as required by law.
3. Employees will receive basic orientation training that includes all required safety topics that pertain to a specific job.
4. Records of all training will be maintained at the branch and corporate levels as necessary.
5. Regional Safety Committee conference calls will take place periodically as to unite the views and concerns of all of our branches.
6. Each injury or incidence of property damage that occurs, no matter how slight, will be reported to management and/or the Branch Safety Officer as soon as possible.

7. Each injury or incidence of property damage will be thoroughly investigated as soon as possible after the occurrence. This will assist us in determining the root cause of the incident and determine remedial actions to prevent reoccurrence.
8. Each injury or incidence of property damage will have a corrective action plan documented to prevent reoccurrence.
9. Periodic inspections will be conducted by the safety committee as well as all levels of management to identify unsafe working conditions, to control health hazards, and to comply with the safety and health standards of every job.
10. Safety Performance with regard to adherence to all policies and procedures of the Triangle Services Safety and Loss Prevention Program will be considered as a part of the management bonus program. Other factors that may also be considered are the number of OSHA Recordable Injuries, Lost Time Injuries, Injury Frequency Ratios, and Injury Severity Ratios.
11. Quarterly reports will be issued to senior management to inform of safety performance by branch.
12. All environmental, health and safety regulations mandated by federal, state, and local authorities will be strictly adhered to as well as Triangle Services and its affiliated companies safety policies and procedures.

Policy Number: SP010
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

General Safety Rules

Purpose:

Establish general safety rules for all Triangle Services work centers.

Applicability:

All Employees

Procedure:

The following is a list of general safety rules that apply to all employees of Triangle Services and its affiliated companies. Safety rules for specific safety topics can be found in the Safety Topics section of this manual.

1. **All injuries, no matter how slight, must be reported** to a foreman, supervisor or manager as soon as possible and in all cases prior to going off shift.
2. Unsafe conditions and practices must be reported to management immediately.
3. Smoking is permitted in designated areas only.
4. Aisles and walkways must be maintained at all times.
5. Employees are responsible for housekeeping in their work area. Trash is to be placed in covered receptacles and emptied daily. Dirty rags are to be placed in designated covered receptacles.
6. Wet surfaces are to be mopped and guarded with the proper warning sign until the surface dries.
7. Horseplay and practical joking are prohibited.
8. All required Personal Protective Equipment (PPE) is to be used when required and as directed by management.
9. Faulty or damaged PPE must be removed from service immediately and reported to management.
10. Adequate footwear which affords substantial foot protection is required to be worn. Mechanics, ramp workers and security personnel are to wear safety shoes that provide the proper safety features for the potential hazards they may be

exposed to. These workers should never wear sneakers, sandals or open toed shoe. Janitorial and Passenger Services personnel are to wear shoes that cover all parts of the feet and are equipped with slip resistant soles.

11. Loose or torn clothing, long unrestrained hair, rings, or pendant jewelry shall not be worn near moving machinery.
12. All hand tools, equipment and extension cords shall be maintained in good repair. Defective tools, equipment and extension cords shall be removed from service at once.
13. Tool safety guards shall not be removed or made inoperative except by direction of supervision. Such guards shall be replaced or reactivated before operations resume.
14. Equipment and machines shall be operated only by authorized personnel. All equipment and machines shall be operated., maintained and repaired according to established procedures. Check that personnel are clear before machine start-up. Follow the LOCKOUT/TAGOUT procedures at all times!
15. Alcohol and non-prescription, controlled substances are prohibited on the work site.
16. Working under the influence of alcohol or non-prescribed drugs is prohibited. Before working while taking prescription medication that may interfere with your work performance or safety you should notify your supervisor.
17. Flammables are to be store in an approved flammable storage cabinet, or approved storage room, when not in use.
18. Vehicle operators are required to follow all state traffic laws, as well as all rules and regulations established on the work site. Seat belts will be used at all times while operating, or riding in a company vehicle, or while on company business.
19. Employees are required to leave the work site premises immediately after the completion of a shift. Employees are required to follow all company policies and procedures while on the work site premises at ALL times, on or off the clock.
20. Employees must follow all signs, posters and safety bulletins posted on the work site.
21. Heavy loads should always be team-lifted and carried. Employees are required to use proper lifting technique at all times when lifting any object.
22. Never come into contact with the moving parts of equipment, machinery or tools.
23. All employees are required to attend all scheduled and announce safety training and briefings
24. Report suspicious persons or activities to your supervisor or building management immediately.
25. Only authorized and trained employees may repair or adjust machinery and equipment. Lockout /Tagout Procedures must be followed before removing any machine guards, access panels/doors or working on powered machinery and equipment. Replace all guards, panels/doors when the job is completed, and before Lockout and Tagout is removed.
26. Only qualified and trained employees may work on or near exposed energized electrical parts, wiring, components or equipment. Follow Electrical Safety Rules when working with electrically powered machinery and equipment.

27. It is Triangle Services' policy that no employee shall enter a permit required confined space. If entry to a permit required confined space is mandated by operational circumstance, only authorized and trained employees may enter a posted confined space. All permit required confined spaces will be posted "Confined Space - Permit Required". Entry is allowed only after the Director of Safety has been contacted and permits are properly issued.
28. Only authorized and trained employees may dispense or use chemicals. It is the responsibility of the employee to know where all Material Safety Data Sheets (MSDS) are located, and how to correctly interpret the information provided. Any questions concerning the proper handling and use of any chemical after reading the MSDS should be directed to management prior to using that chemical.

Your Manager or Supervisor may have additional safety rules or precautions that are specific to your location, and can be found in your site specific safety manual. You are required to follow all lawful safety rules and precautions issued by your Manager or Supervisor.

These rules are for the protection of all employees, and are to be considered as conditions of employment**. Failure to follow the above rules may cause serious injury and/or illness. Disciplinary action, up to and including termination, will be used to assure rule enforcement. Please use common sense and think before you act. If you are not sure how to complete a job or task safely or have any questions, you are required to ask your Supervisor for further instruction.**

Policy Number: SP020
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Safety program disciplinary policy.

Purpose:

To ensure compliance with all safety policies and procedures by specifying disciplinary actions to be taken in the event that a policy or procedure is violated.

Applicability:

All employees

Procedure:

The Company wants its employees to work in a positive, productive atmosphere. However, employees who violate safety rules will be disciplined in order to protect their own safety and the safety of their co-workers. Depending on the severity and frequency of a safety violation, an employee may be:

A. Immediately discharged;
B. Suspended;
C. Given a written warning;
D. Given a verbal warning

The following disciplinary guidelines classify violations according to their seriousness (Groups A, B, C, and D), for which certain penalties are suggested, for example, unsafe conduct by an employee may violate several provisions of the groups. This list is intended to suggest examples of inappropriate behavior. It is not a comprehensive list of all safety violations for which an employee may be disciplined or discharged.

The following disciplinary policies do not in any way bind the Company to follow a particular course of conduct. The Company in its sole discretion may change these policies at any time. In addition, nothing in the policies changes the at-will nature of employment with the Company. An employee may still be terminated with or without cause, with or without notice, at the option of either the Company or the employee, except as otherwise provided by law.

Group A

1. Deliberate violation of the Lockout/Tagout policy.
2. Deliberate violation of the operational check policy.
3. Being intoxicated or under the influence of any controlled substance while at work
4. Possession of alcohol or illegal drugs on Company premises
5. Deliberate or reckless misconduct that endangers the life or safety of others or oneself.
6. Deliberate falsification of any documents related to safety matters
7. Fighting or deliberately harmful contact with co-workers
8. Violation of Company safety policy, which could cause serious injury or death.

Group B

1. Refusal to obey a supervisor's safety instructions
2. Driving a forklift or any other machinery without required approval
3. Horseplay and practical joking

Group C

1. Failure to report an injury on the shift that it occurred.
2. Smoking or eating in unauthorized areas
3. Failure to report an unsafe condition
4. Failure to use proper signage on wet or slippery surfaces
5. Improper housekeeping is a work area
6. Operating tools with safety guards in place

Group D

1. Using tools or extension cords with damaged plug or insulation.
2. Not using, or improperly using PPE
3. Failure to report damaged PPE
4. Failure to use proper foot protection
5. Failure to attend safety training

DISCIPLINARY PENALTIES

The following list provides a general guide for disciplinary actions for the above violations.

	1st Offense	2nd Offense	3rd Offense	4th Offense
Group A	Immediate discharge			
Group B	Suspension	Discharge		
Group C	Written Warning	Suspension	Discharge	
Group D	Verbal Warning	Written Warning	Suspension	Discharge

VERBAL WARNINGS

Verbal warnings are used to inform an employee of a safety violation so that the employee can immediately correct the situation and ensure that they are performing their duties safely. The member of the management team that noted the violation will report the verbal warning to the site manager and the details of the warning will be entered into the employee's personnel record. The information will include the employee's name and employee #, time and date of the violation, a description of the violation, and what actions were taken to correct the violation. The employee who committed the violation will be informed that a formal verbal warning has been issued and if they wish to include any comments in their record they will be entitled to meet with the site manager to discuss their concerns.

WRITTEN WARNINGS

When given, written warnings may help employees know where they stand and improve their performance. Management will issue written warnings that include the reasons for the supervisor's dissatisfaction. Management shall use existing counseling forms when issuing any type warning. Warnings will include a statement of the actions you need to take or results that need to be achieved to avoid further problems. However, the written warnings do not legally obligate or bind the employer or alter the at-will nature of the employee's employment with the Company. An employee who has received a warning may still be terminated with or without cause, and with or without notice, at any time.

Any employee who receives a written warning must immediately acknowledge receipt by signing the warning. An employee who disagrees with the written warning may discuss his or her reasons for doing so with the supervisor. It is generally best to inform the supervisor of any error at the time that the warning is issued, which can be documented on the bottom of the form. An employee who believes that a supervisor has not responded fairly to the employee's comments may contact his/her Supervisor's Senior Manager via phone, in confidence.

Policy Number: SP035
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Site Safety Audit Program

Purpose:

The implementation of a strong safety program is necessary to ensure the safety of all employees and to ensure that the site management team is in compliance with all Federal, State, Local and Corporate standards. The Site Safety Audit Program is designed to ensure that the program is constantly evaluated from several perspectives and is functioning as required.

Applicability:

This procedure applies to all levels of the Triangle Services, and affiliated companies, management team and all members of the Triangle Services Safety Committee.

Procedure:

General

This procedure will ensure that each operating area has developed, implemented and is maintaining a functional, effective safety program through the use of audits. The Triangle Services Safety Audit Program is a three level program utilizing all levels of management and the safety committee. This procedure will detail these three levels:

- Internal safety inspections by site management/safety committee
- Regional/Executive Manager Safety Inspections
- Formal audits by the Director of Safety or designated member(s) of the management team.

Internal Safety Inspections

The site management team and the safety committee have specific, technical knowledge of their operation and will visit each operating area much more frequently than other members of the Triangle Services management team. These factors create a unique

opportunity to constantly evaluate the work areas for hazards or non-compliance issues. For this reason, internal safety inspections are crucial to the safety audit program.

Frequency of Inspections

Quick informal inspections of the work center should be conducted daily to ensure that obvious safety hazards that present an imminent danger to employees are addressed immediately. Formal, documented internal safety audits are to be conducted, at a minimum, with the following frequency:

Table 1

	>9 Employees	3 to 9 Employees	1 or 2 Employees
On-site manager/supervisor/lead	Weekly	Bi-Weekly	Bi-Weekly
No on-site manager/supervisor/lead, less than 40 miles from administrative office	Weekly	Bi-Weekly	Monthly
No on-site manager/supervisor/lead, more than 40 miles from administrative office	Bi-Weekly	Bi-Annual	Annually

Inspection Procedure

Internal safety inspections will focus on identifying and correcting physical hazards within the workplace to ensure that a safe working environment exists. The documentation of these inspections is critical to demonstrate a proactive approach to hazard assessment to any regulatory body that may evaluate our approach to safety.

Internal inspections will consist of a physical walk through of all spaces under the sole responsibility of Triangle Services employees. This would include:

- Guard shacks
- Equipment/chemical/supply rooms or cages
- Shop areas
- GSE staging areas
- Ramp operations areas
- Baggage rooms
- Customer service areas
- Break rooms, locker rooms, restrooms
- Offices

Triangle Services Internal Safety Inspection form, SF020, will be used during the inspection. Items that are in compliance will be marked in the “Yes” column, areas that need corrective action will be marked in the “No” column and the required action will be

documented in the "Remarks" section at the bottom of the page. All identified hazards are required to be corrected within 24 hours. Once the deficiency has been corrected the remarks section will be update the action(s) taken. If an identified deficiency cannot be corrected within 24 hours, the responsible Regional or Executive Manager must be informed of the issue and made aware of the circumstances preventing the deficiency from being corrected. If the deficiency cannot be corrected within 48 hours of the time the Regional or Executive Manager is notified (within 72 hours of discovery of the deficiency), the Regional or Executive Manager will notify the Director of Safety. The Director of Safety will work with the executive, local and client management teams to address the deficiency and implement appropriate corrective action(s).

Record Keeping

All completed Internal Safety Inspection forms (SF020), will be filed at the local administrative office in such a manner as to provide quick access to the forms by a regulatory agency or any member of Triangle Services management team that requests a review of these documents.

Regional/Executive Manager Inspections

Regional and Executive Managers often have the opportunity to travel to the work centers within their area of responsibility to conduct business. These site visits afford the perfect opportunity to conduct a quick spot-check of the local safety program. Safety inspections of this nature will be invaluable in that they will assure the regional/executive manager that their employees are safe, their operational areas are in compliance, and provide an opportunity to demonstrate to the local management teams their commitment to the safety program.

Inspection Procedure

These inspections will focus primarily on the administrative aspects of the safety program, along with a quick check of the more common physical safety violations noted during formal safety audits. The visiting manager will use the Triangle Services Regional/Executive Manager Safety Inspection form, SF021, while conducting the audit.

The audit will begin with a safety document review with the site management team. Each applicable item in the "Administrative" section of form SF021 will be presented to the inspecting manager. Each document will be evaluated and noted on form SF021 if it is in compliance or not.

The next phase of the inspection will consist of a quick walk-through of all areas under the sole responsibility of Triangle Services. The walk-through will focus on the eight items listed in the "Physical Hazards" section of form SF021, but if other hazards are noted, they should be listed in the "Remarks".

Any deficiency noted, whether if is an administrative issue or physical hazard, should be detailed in the "Remarks" section of Form SF021. The remarks should include a description of the deficiency and the required steps to correct the issue. Physical hazards should be corrected within 24 hours of discovery. Administrative issues must be corrected within a mutually accepted time frame, but in no case should this time frame exceed 60 days. If the 24 hour limit for physical hazards or the 60 day limit for administrative issues cannot be met, the Director of Safety must be informed. The Director of Safety will work with the executive, local and client management teams to address the deficiency and implement appropriate corrective action(s).

The inspecting manager is responsible to obtain evidence of completion for all deficiencies noted. This evidence can be in the for of:

- Forwarding photographs of corrections to physical hazards by the local management to the inspecting manager.
- Forwarding completed/updated documents via e-mail or fax by the local management to the inspecting manager.
- Follow up visit to the site by the inspecting manager or another manager designated by the inspecting manager to visually verify correction of a deficiency.
- Completion of Form SF023, Certification of Safety Deficiency Correction, by the local management team and forwarded to the inspecting manager.

When all deficiencies have been corrected, form SF021 will be updated with the date of completion for each deficiency and any additional notes that may be required to explain the corrective actions taken to correct each item. The form will then be signed by the inspecting manager and forwarded to the Director of Safety for review and filing.

Record Keeping

Forms SF021 will be tracked and filed by the Director of Safety to ensure a single point of access to all safety inspection forms created by the Regional/Executive Management team. A quarterly recap of all inspections performed will be provided to the Vice President of Employee Satisfaction.

Formal Safety Audits

Formal safety audits will be conducted periodically by the Director of Safety or a member of the Triangle Services management team designated by the Director of Safety. These formal audits will examine all aspects of an operating area's safety program. These audits will be conducted in the same manner as an OSHA inspection and may consist of:

- Document review of all administrative aspects of the safety program.
- Site walk-through to assess potential physical hazards.
- Employee interviews to determine effectiveness of the training program.

Formal Audit Schedule

A tentative Formal Safety Audit schedule will be prepared and issued to the field by no later than January 10th. All operations managers are required to review the schedule by January 31 and inform the Director of Safety if there are any operational conflicts with

proposed audit dates. All efforts will be made to work with local management to ensure that final scheduled dates will be acceptable to the local management team and the Director of Safety. The final Formal Audit Schedule will be released to the field on February 1.

Formal Audit Preparation

30 days prior to the scheduled audit date, the Director of Safety will send a reminder of that date to the local management team. Upon receipt of the reminder the local management team will return confirmation of the date, or, if operational circumstances warrant, request an alternate date for the audit. Alternate dates for an audit are at the sole discretion of the Director of Safety. Upon confirmation of the scheduled audit date, or arrangement for an alternate date, the audit will proceed as schedule regardless of extenuating circumstances.

It is the responsibility of the site management team to review form SF022 and have all applicable documents ready for review. Additionally, it is the responsibility of the site management team to review previous audit reports and have verification of compliance to observed discrepencies ready for review.

Formal Audit Procedure

On the agreed upon date and time, the Director of Safety will meet with the local management team. Ideally the Site Manger or Safety Officer will represent the operating area during the audit. If neither of these management team members are available due to operational circumstances, a representative designated by the site/area manager will meet with the Director of Safety. A designated representative will be expected to provide all requested documents, accompany the Director of Safety during a complete facility/area walk-through, arrange employee interviews as requested and answer all pertinent questions raised by the audit process.

The audit will be conducted using Triangle Services Safety Form SF022, Formal Safety Audit. Any discrepancies noted during the audit process will be discussed with the site management team representative. This discussion will include:

- The reason for the observed discrepancy
- The steps needed to correct the noted discrepancy
- An agreed upon time-frame for completion of the corrective actions.

Formal Audit Report

A formal audit report will be generated by the Director of Safety for each formal audit conducted. This report will be generated within 24 hours of the audit and will be distributed to:

- Site management team
- Area/Regional Manager
- Executive Manager
- Vice President of Employee Satisfaction

- President and CEO of Triangle Services

The formal audit report will contain:

- Site information
- Areas inspected
- Employees interviewed
- Remote locations included in the document review
- All observed discrepancies
- Steps required to correct any discrepancies
- Agreed upon completion date for each discrepancy
- Additional remarks that will detail additional steps to be taken for the improvement of the area safety program.

Formal Audit Response

It is the responsibility or the site management team to correct all safety program discrepancies noted on the Safety Audit report by the established completion date. Verification of the steps required to correct each discrepancy must be provided by any of the following:

- Forwarding photographs of corrections to physical hazards by the local management team to the Director of Safety.
- Forwarding completed/updated documents via e-mail or fax by the local management to the Director of Safety.
- Follow up visit to the site by the Director of Safety or another manager designated by the Director of Safety to visually verify correction of a deficiency.
- Completion of Form SF023, Certification of Safety Deficiency Correction, by the local management team and forwarded to the Director of Safety.

Any discrepancies that are not corrected by the site management team in the agreed upon time frame will become the responsibility of the Executive Manager responsible for that operating area. The Executive Manager will meet via phone or in person with the Director of Safety to agree upon alternate deadlines for the completion of any remaining discrepancies.

Any items that may remain uncorrected after alternate deadlines have passed will be referred to Triangle Services President and CEO for final determination of actions to be taken, or policy to be adopted, to account for the uncorrected violations of safety standards.

Policy Number: SP040
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Safety Committee and Delegation of Responsibility

Purpose:

Triangle Services is comprised of several operating divisions, each with different management structures. Triangle's safety policies and procedures will be standardized throughout the corporation regardless of individual operating division structure. To facilitate the achievement of this objective, Triangle Services has established a Safety Committee. The committee and its members share the common responsibility for the overall safety culture of Triangle Services and for the adherence to policies and procedures.

Applicability:

All employees

Terminology:

In order to standardize the terminology within Triangle's safety committee, position designations have been created for members of the committee.

- ◊ Director of Safety: This person implements and oversees the safety program for Triangle services.
- ◊ Regional Safety Manager: This person oversees the safety program within a region or operating division and ensures that policies and procedures are observed. The Regional or Senior manager for a region will typically fulfill these requirements concurrently with their operational duties and responsibilities.
- ◊ Branch Safety Manager: This person ensures that all employees within an operating branch or region are aware of, and observe, all safety program policies and procedures. The Branch Manager will typically fulfill these responsibilities concurrently with their operational duties and responsibilities.

- ◊ Site Safety Officer: This person works with the Branch Safety Manager to ensure that safety program policy and procedures are observed, and workplace hazards are identified within single or multiple work sites. A site Foreman, Supervisor, Lead or responsible worker will typically fulfill these responsibilities concurrently with their operational duties and responsibilities.

Procedure:

Triangle Services will have one safety program for all of the operating divisions. The main goal of this program is to ensure the safety of all of our employees. This goal will be met with the greatest efficiency if we all work together as a team and ensure that we approach safety with the same policies and procedures in every work center across the country. Efficiency will be the greatest when the safety committee is aligned with current management structures so that the safety procedures work hand-in-hand with operational procedures. Because the safety committee will be regionalized in this structure, communication between branches and regions will be paramount to our success. The Director of Safety will be tasked with providing channels of communications so that all employees within the Triangle family are kept current with safety issues, standards and developments.

These positions will be filled by existing members of the management team, within each operating division. A Vice President or Regional Branch Manager may serve as the Regional Safety Manager and a Branch Manager may serve as a Branch Safety Manager on the Regional Safety Committee, etc. The responsibilities assigned to each member of the safety committee may be delegated by the designated committee member to other personnel for completion, but ultimately the designated safety committee member will be responsible for the completion of all tasks detailed within these descriptions.

Chief Executive Officer

- ◊ Allocates the financial and management resources required to support the safety program
- ◊ Approves any bonus or incentive programs related to safety performance.
- ◊ Assigns responsibility for the safety program throughout the organization.
- ◊ Reviews and approves all safety programs designed to meet the goals of the company.
- ◊ Assigns spending authorization associated with the safety program.
- ◊ Reviews overall safety performance on a quarterly basis with Director of Safety and/or the operating division leadership.
- ◊ Evaluates action plans to remedy safety and risk problems.

CHIEF FINANCIAL OFFICER

- ◊ Analyzes return on investment of safety program on a quarterly basis.
- ◊ Selects insurance carriers and brokers.
- ◊ Ensures compliance with all reporting requirements by direct reports.
- ◊ Works in conjunction with and in support of Director of Safety in areas such as interacting with insurance carriers, reporting and financial impact of safety programs.

DIRECTOR OF SAFETY

- ◊ Publishes, reviews, and amends Triangle Services and its affiliated companies Safety Program.
- ◊ Reviews and approves training material.
- ◊ Works with IT department to ensure required safety material is available to Regional Safety Committees on the Triangle intranet.
- ◊ Approves all job hazard analysis and works with the Regional Safety Manager, Branch Manager and Site Safety Officer to develop preventive procedures and determine required PPE to minimize the risk of an identified hazard.
- ◊ Works with Regional and Branch Managers to develop action plans to improve overall safety performance.
- ◊ Performs annual site inspections and audits at each branch to identify unsafe working conditions or determine if operational procedures require modification.
- ◊ Reports any findings of site inspections to President/Chief Executive Officer.
- ◊ Stays abreast of all changes in Federal, State, and Local regulations. Communicates any learned knowledge to appropriate management and employees to ensure compliance.
- ◊ Updates corporate procedures to reflect changes and works with branches to implement the required changes.
- ◊ Participates in the investigation of accidents and injuries and cooperates in the preparation of material and evidence for organization used in hearings, law suits, and insurance investigations.
- ◊ Assists Branch Managers in the event of an OSHA or other government investigation.
- ◊ Consults with all branches on the use of equipment, tools, operating procedures and machinery.
- ◊ Collects, summarizes, and reports safety performance data.

REGIONAL SAFETY MANAGER

- ◊ Establish and participate in the Regional Safety Committee
- ◊ Establish and participate in the monthly Regional Safety Committee conference call. Submit conference call report form to the Director of Safety.
- ◊ Develops the budget for safety program expenditures for each branch within the region.
- ◊ Reviews and submits monthly safety training documentation to the Director of Safety.
- ◊ Reviews the annual training plan for each branch within the region to ensure that all required topics are presented.
- ◊ Reviews the proposed schedule of training material for each branch to ensure that it has been approved for use.
- ◊ Investigates all accidents resulting in the death or hospitalization of employees or property damage to company or client assets.
- ◊ Reviews accident reports to verify that they are correctly filled out and submitted to the Director of Safety and the Executive Assistant to the CFO in accordance with corporate policy and procedure,
- ◊ Works with the Branch/Site Safety Manager and Site Safety Officer to develop an action plan to prevent reoccurrences of similar accidents following each reported accident.
- ◊ Reviews the results of bi-annual safety audits conducted by the Branch Safety Managers and presents the Director of Safety with a regional safety audit summary.
- ◊ Reports all third party injuries/property damages to the Director of Safety and the Executive Assistant to the CFO within 24 hours of occurrence.
- ◊ Reviews safety program data provided by the Director of safety and works with the Branch Safety Manager and the Site Safety Officer to develop corrective action plans that address any observed trends.
- ◊ Approves training courses and seminars conducted by third party organizations.
- ◊ Reviews Job Hazard Analysis form with the Director of Safety, Branch Manager and Site Safety Officer to develop preventive procedures and determine require PPE to minimize the risk of an identified hazard.

BRANCH SAFETY MANAGER

- ◊ Appoints Site Safety Officers for each site within the branch.
- ◊ Ensures that all new hires have received the requisite orientation training and the proper documentation has been completed.
- ◊ Develops annual training plan for each work center within the branch. Plan is to include all required training topics, and other topics that address possible hazardous conditions within each work center.
- ◊ Ensures that monthly safety training has been completed and documented. Training is to be accompanied by a 5 to 10 question quiz that is either provided with the training material or developed by the Branch Safety Manager.
- ◊ Recommends training courses and seminars offered by third party organizations to the Regional Safety Manager.
- ◊ Conducts bi-annual safety audits of each work center within the branch, and submits reports to the Regional Safety Manager.
- ◊ Understand and explain all corporate safety policies to Branch Safety Officer and employees.
- ◊ Review safety performance each month with applicable employees.
- ◊ Ensures that accident reports are correctly filled out and submitted to the Regional Safety Manager, Director of Safety and the Executive Assistant to the CFO within 24 hours of the accident.
- ◊ Immediately notify the Regional Safety Manager and the Director of Safety in the event of an accident that results in the death of an employee or the hospitalization of three or more employees.
- ◊ Immediately notify the Regional safety Manager and the Director of Safety of any OSHA audit at any facility within the branch.
- ◊ Review and post the OSHA 300A log annually, as required by law (February 1 through April 30).
- ◊ Review and approve all safety related expenditures within level of authority.
- ◊ Institute disciplinary action with employees who demonstrate poor safety performance or fail to comply with the safety program.
- ◊ Report any unsafe conditions that may have corporate wide implications to THE Director of Safety.
- ◊ Reviews Job Hazard Analysis form with the Director of Safety, Regional Safety Manager and Site Safety Officer to develop preventive procedures and determine required PPE to minimize the risk of an identified hazard.

BRANCH SAFETY OFFICER

- ◊ Participates in safety committee at the branch, Regional and corporate levels. Attends all safety conference calls.
- ◊ Integrate safety policies with operational issues to insure compliance at the branch level.
- ◊ Reports all instances of non-compliance to the Branch Manager.
- ◊ Works with the Branch Safety Manager to complete accident reports.
- ◊ Participates in investigations of all accidents involving fatality, serious injury, property damage and third parties.
- ◊ Stays abreast of all local and state safety regulations. Communicate any learned knowledge to the Branch Safety Manager.
- ◊ Develops Job Hazard Analysis as directed by the Branch Safety Manager and reviews the results with the Director of Safety, Regional Safety Manager and Branch Safety Manager to develop preventive procedures and determine required PPE to minimize the risk of an identified hazard.
- ◊ Provides safety training as directed by the Branch Safety manager.
- ◊ Maintains Safety manual on-site as directed by the Branch Safety Manager and shares its contents with employees upon request.
- ◊ Participates in safety committee meetings at the branch and corporate levels.

ALL EMPLOYEES

- ◊ Attend all safety training sessions as directed by managers, supervisors, or company policy.
- ◊ Wear personal protective equipment required for the job.
- ◊ Follow corporate safety rules when carrying out job tasks.
- ◊ Stay alert while performing your job.
- ◊ Immediately report all unsafe conditions, injuries, or general equipment damages to your supervisor.
- ◊ Cooperate in the elimination of fraudulent and exaggerated reports of injuries by reporting such knowledge.

Participate on Branch Safety Committee when asked to do so.

Policy Number: SP050
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Worker's Compensation

Purpose:

To inform employees of their rights in regard to work place injuries and coverage under worker's compensation laws.

Applicability:

All employees

Procedure:

Worker's compensation laws hold that employers should assume costs of occupational disabilities without regard to any fault involved. These "costs" include both any medical treatment and/or lost wages. The underlying objective of worker's compensation laws are:

- Provide sure, prompt and reasonable income and medical benefits to work-accident victims, or income benefits to their dependents, regardless of fault.
- Provide a single remedy and reduce court delays, costs and workloads arising out of personal injury litigation.
- Relieve public and private charities of financial drains-incident to uncompensated industrial accidents.
- Eliminate payment of fees to lawyers and witnesses as well as time-consuming trials and appeals.
- Encourage maximum employer interest in safety and rehabilitation through appropriate experience rating mechanisms.
- Promote frank study of causes of accidents (rather than concealment of fault) reducing preventable accidents and human suffering.

Not only do we all have a role in handling occupational injuries, our insurance company, broker, and risk specialists all work with us to ensure that we acknowledge our on-the-job injuries and handle them legally.

INSURANCE CARRIER

Our current insurance carrier handles most functions of our worker's compensation claims including payment to outside parties such as physicians, hospitals, attorneys. The carrier also pays out actual worker's compensation wages to our employees who are temporarily disabled as a result of an on-the-job injury and researches fraudulent claims for the purpose of prosecution. Additional services such as on-line access, surveillance, customer service teams in each state to answer our questions, and online reporting and data are all made available to us.

Our common goal with the insurance carrier is to reduce the number of compensation claims. If this were simply a matter of increasing employee safety, dealing with it would be straightforward. Cost-containment can only be accomplished if we report accidents promptly and accurately, investigate the cause of the incident and take preventive action. Since laws vary, we must all be well versed in the reporting requirements and time frames mandated in our state of operation. States do, and will, impose financial penalties for those accidents not reported on time.

Policy Number: SP060
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

OSHA Record Keeping Requirements

Purpose:

In order to verify the effort expended in compliance with this Safety Program, and to fulfill the requirements of the Federal, State and Local governments Triangle Services and its affiliated companies will maintain records as detailed in this procedure.

Applicability:

This procedure applies to the Director of Safety, Assistant to the CFO, and all site managers/supervisors, as defined in the procedure.

Procedure:

OSHA (Form 300)

OSHA 300 logs will be maintained at the Triangle corporate office using information obtained from the field. It is imperative that all accidents are reported to the Triangle corporate office and the Director of Safety a soon as possible following an accident, but no longer than 24 hours after the accident is reported. It is the responsibility of each Branch Safety Officer to obtain a copy of the OSHA 300 A form for their facility prior to the end of January, for the previous year, and post this document in a conspicuous, public area from February 1 through April 30. A copy of the previous 5 years of OSHA 300 A forms must be maintained in the site safety records.

NOTE: Missing or incorrect information on the OSHA 300 log is the most commonly cited violation. Federal law allows "zero tolerance for error" when evaluating this documentation.

Training

To ensure that all employees understand the incident reporting requirements and are aware of their own and other's responsibilities, annual training sessions will be held with all employees to review procedures and responsibilities. New Employee Orientation training will include information on incident reporting and procedures. Employees involved in incident investigation and the completion of reporting forms will be trained in these areas as needed.

Program Audits

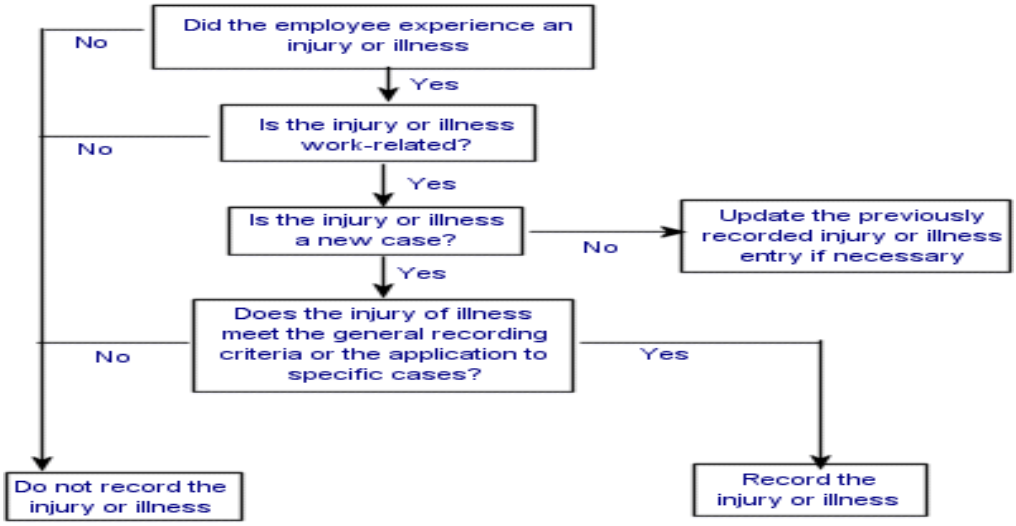
The effectiveness of a program can only be accomplished if the program is implemented and maintained. Periodic reviews and audits shall be conducted to confirm that all employees are familiar with the incident reporting requirements and that the program is managed properly. These audits will consist of:

- Annual reviews of accident reports to ensure all records have been maintained and are complete.
- Annual review of the program with company insurance carriers and workers compensation third party provider.
- Annual refresher training for employees involved in record entry and record keeping
- Annual refresher training is necessary for all employees that are involved with detailing the accident reporting procedures.

Recording Injuries & Illnesses

Record keeping concepts and guidelines are included in OSHA Standard 1904. The following summarizes the major record keeping concepts and provides additional information to aid in keeping records accurately.

Recordability Decision Tree



Injuries and Illnesses must be recorded if...
At the time of the injury or illness, the employee was present in the work environment as a member of the general public rather than as an employee.
The injury or illness involves signs or symptoms that surface at work but result solely from a non-work-related event or exposure that occurs outside the work environment.
The injury or illness results solely from voluntary participation in a wellness program or in a medical, fitness, or recreational activity such as blood donation, physical examination, flu shot, exercise class, racquetball, or baseball.
The injury or illness is solely the result of an employee eating, drinking, or preparing food or drink for personal consumption (whether bought on the employer's premises or brought in). For example, if the employee is injured by choking on a sandwich while in the employer's establishment,

the case would not be considered work-related. Note: If the employee is made ill by ingesting food contaminated by workplace contaminants (such as lead), or gets food poisoning from food supplied by the employer, the case would be considered work-related.
The injury or illness is solely the result of an employee doing personal tasks (unrelated to their employment) at the establishment outside of the employee's assigned working hours.
The injury or illness is solely the result of personal grooming, self medication for a non-work-related condition, or is intentionally self-inflicted.
The injury or illness is caused by a motor vehicle accident and occurs on a company parking lot or company access road while the employee is commuting to or from work.
The illness is the common cold or flu (Note: contagious diseases such as tuberculosis, brucellosis, hepatitis A, or plague are considered work-related if the employee is infected at work).
The illness is a mental illness. Mental illness will not be considered work-related unless the employee voluntarily provides the employer with an opinion from a physician or other licensed health care professional with appropriate training and experience (psychiatrist, psychologist, psychiatric nurse practitioner, etc.) stating that the employee has a mental illness that is work-related.

Consider an injury or illness to meet the general recording criteria if it results in any of the following:

- Death
- Days away from work
- Restricted work
- Transfer to another job
- Medical treatment beyond first aid
- Loss of consciousness.
- Significant injury or illness diagnosed by a physician or other licensed health care professional

Pre-existing Conditions

Pre-existing injuries or illnesses must be recorded only if work activities have "significantly aggravated" the condition. An injury or illness is a pre-existing condition if it resulted solely from a non-work-related event or exposure that occurred outside the work environment. A pre-existing injury or illness has been significantly aggravated when an event or exposure in the work environment results in any of the following:

- Death
- Loss of consciousness
- One or more days away from work
- Days of restricted work
- Job transfer
- Medical treatment
- Change in medical treatment

Medical Treatment

Medical treatment means the management and care of a patient to combat disease or disorder. Medical treatment does not include:

- Visits to a physician or other licensed health care professional solely for observation or counseling.
- The conduct of diagnostic procedures, such as x-rays and blood tests, including the administration of prescription medications used solely for diagnostic purposes
- First aid

First Aid

For record keeping determination "First Aid" means only the following:

- Using a non-prescription medication at nonprescription strength (for medications available in both prescription and non-prescription form, a recommendation by a physician or other licensed health care professional to use a non-prescription medication at prescription strength is considered medical treatment for record keeping purposes)
- Administering tetanus immunizations (other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment)
- Cleaning, flushing or soaking wounds on the surface of the skin

- Using wound coverings such as bandages, Band-Aids™, gauze pads, etc.; or using butterfly bandages or Steri-Strips™ (other wound closing devices such as sutures, staples, etc., are considered medical treatment)
- Using hot or cold therapy
- Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment for record keeping purposes)
- Using temporary immobilization devices while transporting an accident victim (e.g., splints, slings, neck collars, back boards, etc.).
- Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister
- Using eye patches
- Removing foreign bodies from the eye using only irrigation or a cotton swab
- Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means
- Using finger guards
- Using massages (physical therapy or chiropractic treatment are considered medical treatment for record keeping purposes)
- Drinking fluids for relief of heat stress.

Recording needle stick and sharps injuries

All work-related needle stick injuries and cuts from sharp objects that are contaminated with another person's blood or other potentially infectious material must be recorded as an injury. To protect the employee's privacy, you may not enter the employee's name on the OSHA 300 Log. Follow the privacy requirements of OSHA Standard 1904.

Recording cuts, lacerations, punctures, and scratches.

Record cuts, lacerations, punctures, and scratches only if they are work-related and involve contamination with another person's blood or other potentially infectious material. If the cut, laceration, or scratch involves a clean object, or a contaminant other than blood or other potentially infectious material, record the case only if it meets one or more general recording criteria.

Recording Medical Removal Cases

If an employee is medically removed under the medical surveillance requirements of an OSHA standard, the case must be record on the OSHA 300 Log. Instances of voluntary removal need not be recorded.

Hearing loss recording criteria for calendar year 2003 and later years

Hearing loss is presumed to be work-related if the employee is exposed to noise in the workplace at an 8-hour time-weighted average of 85 dBA or greater, or to a total noise dose of 50 percent, as defined in 29 CFR 1910.95. For hearing loss cases where the employee is not exposed to this level of noise, use the rules in OSHA Standard 1904.5 to determine if the hearing loss is work-related.

If a physician or other licensed health care professional determines that the hearing loss is not work-related or has not been significantly aggravated by occupational noise exposure, do not record the case on the OSHA 300 Log.

If an employee's audiogram shows that a Standard Threshold Shift has occurred, record the case on the OSHA 300 Log by checking the "hearing loss" column. A Standard Threshold Shift is defined as a change in hearing threshold, relative to the most recent audiogram for that employee, of an average of 10 decibels or more at 2000, 3000, and 4000 hertz in one or both ears.

If the employee has never previously experienced a recordable hearing loss, compare the employee's current audiogram with that employee's baseline audiogram. If the employee has previously experienced a recordable hearing loss, you must compare the employee's current audiogram with the employee's revised baseline audiogram (the audiogram reflecting the employee's previous recordable hearing loss case).

Before recording hearing loss cases, use the aging effects table of OSHA Standard 1910.95 to adjust the audiogram and then apply the recording criteria to determine if the case is recordable.

Recording work-related tuberculosis cases

If any employee has been occupationally exposed to anyone with a known case of active tuberculosis (TB), and that employee subsequently develops a tuberculosis infection, as evidenced by a positive skin test or diagnosis by a physician or other licensed health care professional, record the case on the OSHA 300 Log by checking the "respiratory condition" column.

Recorded cases may be lined out or erased if

- The employee is living in a household with a person who has been diagnosed with active TB;
- The Public Health Department has identified the worker as having contact with an individual with a case of active TB unrelated to the workplace, or
- A medical investigation shows that the employee's infection was caused by exposure to TB away from work, or proves that the case was not related to the workplace TB exposure.

Injury & Illness Summary

The summary must be completed by February 1 of the following year. Post a copy of the summary in each establishment in a conspicuous place or places where notices to employees are customarily posted. Ensure that the summary is not altered, defaced or covered by other material. The summary must remain posted until May 1, at which point it is to be filed with the four previous years of summary logs.

Policy Number: SP070
Effective Date: 6/1/2010
Revision: 2
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Accident Investigation and Reporting Procedure

Purpose:

To detail the procedure for investigating, documenting and reporting occupational injuries, vehicle loss, and 3rd party injuries (general liability).

Applicability:

This procedure applies to all employees as detailed in the following section

Procedure:

A. OCCUPATIONAL INJURIES

Occupational injuries are injuries that are sustained by an employee of Triangle Service Inc., as a result of performing work related duties.

I. Occupational Injuries Resulting In Lost Time

a. In the event that an occupational injury occurs, it is the employee's responsibility to inform his/her manager immediately. All occupational injuries MUST be reported prior to the end of the shift on which the injury occurs.
b. Site Manager, Supervisor, Safety officer or Lead (hereafter referred to as "management") will inspect the area in which the accident occurred, noting any contributing factors.
c. Management will interview the affected employee (hereafter referred to as "AE") if employee is responsive. AE full statement will be documented.
d. Management will interview, and document the statements of, any witnesses to the accident.
e. Upon completion of the accident investigation, management will complete Revision 5 of the Triangle Services Occupational Injury

Report (OIR), and the Triangle Services Accident Investigation Report (AIR).

i. The OIR and AIR are contained on the same Excel document. The OIR is required to be completed for ALL accidents, regardless of the severity of the injury. The AIR is required to be completed in the event of any accident that results in employee lost time.
ii. The OIR and AIR are linked so that as the OIR is being completed, fields that are common to both forms are automatically completed on the AIR.
iii. Upon completion of the OIR scroll down to the AIR page and ensure that the common fields are completed.
iv. Proceed to the bottom portion of the AIR and complete the section titled "ACTIONS TAKEN TO PREVENT FUTURE INCIDENTS".
v. The OIR/AIR is **REQUIRED** to be completed electronically by a member of the management team prior to being sent to the corporate office, via e-mail.
vi. In the event that an accident occurs at a site that does not have computer access, the local management can complete the OIR/AIR manually and forward this report via fax to their immediate Supervisor/Manager. Upon receipt of this report the Supervisor/Manager will contact the field management to verify the information and ensure the investigation has been properly conducted. Once all information is verified the Supervisor/Manager will complete the final OIR/AIR electronically.
vii. In the rare event that an injury occurs at a site that does not have ready access by management, it is acceptable to have an employee complete a first draft of an OIR/AIR manually and forward this report via fax to their immediate Supervisor/Manager. Upon receipt of this report the Supervisor/Manager will contact the employee to verify the information. Once all information is verified the Supervisor/Manager will complete the final OIR/AIR electronically.

f. Once the OIR/AIR is completed electronically, it is forwarded, via e-mail, to Cathy Corbley (ccorbley@triangleservices.com) **AND** to Jud Woodings (jwoodings@triangleservices.com).
g. Employee is required to forward a copy of all paperwork issued by the medical clinic, or attending physician, to their immediate supervisor/manager. The supervisor/manager will forward all paperwork, via fax or scanned e-mail, to Cathy Corbley (fax (516) 872-1599) **AND** Jud Woodings (fax (858) 923-1137).

h. Employees that miss work due to an occupational injury are required to provide a return to work authorization signed by the medical clinic or their attending physician to their immediate supervisor/manager before they can return to work. The supervisor/manager will forward a copy of all return to work authorizations, via fax or scanned e-mail, to Cathy Corbley **AND** Jud Woodings.

II. Occupational Injuries NOT Resulting In Lost Time

a. In the event that an occupational injury occurs, it is the employee's responsibility to inform his/her manager immediately. All occupational injuries MUST be reported prior to the end of the shift on which the injury occurs.
b. Site Manager, Supervisor, Safety officer or Lead (hereafter referred to as "management") will inspect the area in which the accident occurred, noting any contributing factors.
c. Management will interview the affected employee (hereafter referred to as "AE"). AE full statement will be documented.
d. Management will interview, and document the statements of, any witnesses to the accident.
e. Upon completion of the accident investigation, management will complete Revision 5 of the Triangle Services Occupational Injury Report (OIR).
    i. The OIR is **REQUIRED** to be completed electronically by a member of the management team prior to being sent to the corporate office via e-mail.
    ii. In the event that an accident occurs at a site that does not have computer access, the local management can complete the OIR manually and forward this report via fax to their immediate Supervisor/Manager. Upon receipt of this report the Supervisor/Manager will contact the field management to verify the information and ensure the investigation has been properly conducted. Once all information is verified the Supervisor/Manager will complete the final OIR electronically.
    iii. In the rare event that an injury occurs at a site that does not have ready access by management, it is acceptable to have an employee complete a first draft of an OIR manually and forward this report via fax to their immediate Supervisor/Manager. Upon receipt of this report the Supervisor/Manager will contact the employee to verify the information. Once all information is verified the Supervisor/Manager will complete the final OIR electronically.

f. Once the OIR is completed electronically, it is forwarded, via e-mail, to Cathy Corbley (ccorbley@triangleservices.com) **AND** to Jud Woodings (jwoodings@triangleservices.com).

g. Employee is required to forward a copy of all paperwork issued by the medical clinic, or attending physician, to their immediate supervisor/manager. The supervisor/manager will forward all paperwork, via fax or scanned e-mail, to Cathy Corbley (fax (516) 872-1599) **AND** Jud Woodings (fax (858) 923-1137).

B. VEHICLE LOSS

A vehicle loss is any damage to any Triangle Services owned vehicle, or major industrial equipment. As an example, this could be a passenger vehicle, airport ramp equipment, golf carts, etc.

1. In the event that a vehicle loss accident occurs, it is the employee's responsibility to inform his/her manager immediately. All vehicle loss accidents MUST be reported prior to the end of the shift on which the injury occurs.
2. Site Manager, Supervisor, Safety officer or Lead (hereafter referred to as "management") will inspect the area in which the accident occurred if practical, noting any contributing factors.
3. Management will interview the affected employee (hereafter referred to as "AE") if employee is responsive. AE full statement will be documented.
4. Management will interview, and document the statements of any witnesses to the accident.
5. Upon completion of the accident investigation, management will complete the Triangle Services Automobile Loss Notice. All sections highlighted in yellow are to be completed.
6. Once the Triangle Services Automobile Loss Notice is completed electronically, it is forwarded, via e-mail, to Cathy Corbley **AND** Jud Woodings.
7. If a Vehicle Loss Accident results in an Occupational Injury or a 3rd party property damage/injury, in addition to the Automobile Loss Notice, an Occupational Injury Report/Accident Investigation Report and/or General Liability Notice must also be completed in accordance with the applicable section of this procedure.

C. GENERAL LIABILITY ACCIDENT

A General Liability Accident is any event that results in property damage or bodily injury of personnel/equipment not belonging to Triangle Services, which occur in a facility maintained by Triangle Services, or as a result of work related activities performed by Triangle Services employees. Examples of this are vehicle accidents involving non-company vehicles, aircraft damage by ramp personnel, injuries sustained by falling in an area where Triangle Services are mopping, etc.

1. In the event that a general liability accident occurs, it is the employee's responsibility to inform his/her manager immediately. All general liability

2. Site Manager, Supervisor, Safety officer or Lead (hereafter referred to as "management") will inspect the area in which the accident occurred if practical, noting any contributing factors. If possible, photographs of the accident scene should be taken.
3. Management will interview the affected employee Triangle Services employee (hereafter referred to as "AE") and any persons injured, if possible. Full statements will be documented.
4. Management will interview, and document the statements of any witnesses to the accident.
5. Upon completion of the accident investigation, management will complete the Triangle Services General Liability Notice. All sections highlighted in yellow are to be completed.
6. Once the Triangle Services General Liability Notice is completed electronically, it is forwarded, via e-mail, to Cathy Corbley **AND** Jud Woodings.

Policy Number: SP080
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Return To Work

Purpose:

This program is intended to assist employees in transitioning back to full duty after lost time due to illness or injury.

Applicability:

All employees are covered under this policy. Application of this policy will directly affect employees who return to work with a doctor-prescribed physical restriction.

Procedure:

Functional Capacities Evaluation

The Company utilizes a Functional Capacities Evaluation that is to be completed by the treating physician or health care provider and then faxed back to the corporate office at (908) 755-3025. The form must be completed prior to allowing the employee to return to work. This form specifically describes the physical limitations imposed on and injured or ill employee. The information provided on this form will allow management to identify available light duty assignments for the affected employee.

Approved Medical Leave of Absence

If the physician or health care provider releases the employee for full duty, the employee must report to work. If the doctor prescribes a work restriction, the employee *must* contact his/her supervisor for a light duty assignment. Management will make reasonable accommodations to facilitate the assignment of light duty. However, if management determines that no light duty is available, the employee will be released from work. If a light duty assignment is available, but the employee elects to stay out of work after receiving medical clearance for duty, the subsequent time away from work may be treated as an unexcused absence. The missed days will be unpaid and disciplinary action may be considered.

Physical Therapy / Medical Follow-up

If a medical provider for treatment of an injury prescribes a follow-up visit or physical therapy, the employee must meet the commitment of his/her appointments. If the employee is unable to attend an appointment, the clinic must be contacted in advance for cancellation or rescheduling. Because of the possibility of unnecessary cancellation charges to the company, missed appointments without advance notice may result in disciplinary action.

Extended Leave of Absence

When released to full duty and upon return to work, the employee will receive full pay. While the employee is working with a work restriction as prescribed by a doctor, the employee's regular pay rate will be applied. After 5 days on prescribed light duty, the employee will receive the pay rate that coincides with the job function that is being performed. This pay rate may not exceed the employee's normal rate of pay. If the employee is unable to work, with or without restrictions, worker's compensation or medical pay benefits will apply.

Light Duty Duration

A Return to Work / Light Duty assignment may be offered for up to 30 days. During that time, if a light duty assignment has been identified under which the employee may safely perform within the medical limits, the employee must report for work. After 30 days, if the employee still has a medical restriction, the employee may be released from light duty assignments. However, the employee's original position will be protected for an additional 60 days. If the employee's absence or prescribed work restriction extends beyond 90 days after the initial diagnosis, the employee's position may be permanently filled. (Personal and medical absences that are covered by the Family Medical Leave Act will be handled as required). Per labor statutes, an employee who fully recovers from a work-related injury within two years of the original injury date will be reinstated in the first available position that is comparable to the position held at the time of the injury. Management will make reasonable accommodations to facilitate the return to work for employees with permanent physical restrictions.

Displaced Employees

The displaced employee will be permitted to return to duty after:

The medical provider submits documentation verifying the employee's fitness for duty, and outlining any permanent or temporary physical restrictions, and
The employee submits a job change request, and is accepted into an open position for which he/she is fully qualified.

The employee's complete work history and documented performance will also be a factor in placing the employee.

Employee Return To Work Authorization

Once an employee has received medical clearance to return to work from their medical provider, the employees manager or supervisor will complete a Request For Return To Work and forward this request, along with a copy of all paperwork from the medical provider to the Director of Safety and the Assistant to the Chief Financial Officer. Once the request has been reviewed, approval will be granted in accordance with physician limitations and work center needs and requirements.

Policy Number: SP090
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Job Hazard Analysis

Purpose:

Job Hazard Analysis (JHA's) is a process of determining physical requirements, environmental conditions and safety factors relating to a specific job or task. JHA's are best used for stationary or repetitive production tasks or product movement, in which the job, equipment and work environment change very little.

Safe Operating Procedures (SOP's) are written step-by-step procedures for a specific non-repetitive task, which may be hazardous or critical. The purpose of a SOP is to provide written guidance for a particular task such that any qualified person can successfully and safely complete the task. SOP's are best developed and used for highly skilled jobs and when the equipment and work environment change often. For example, an SOP with appropriate warnings and cautions, would best be developed and used for tasks such as confined space entry, maintenance tasks, lockout-Tagout, welding operations, system startup and shutdown.

JHA's/SOP's provide

- PPE determination process
- Resource for supervisors to train new employees
- Control of job steps
- Identification and control of potential hazards
- Benchmark for accident investigation
- Review of employee performance

Applicability:

A job hazard analysis should be completed for each preventive and routine corrective task. For non-routine tasks a Job Hazard Analysis is REQUIRED to be completed prior to starting the job to ensure that all Engineering Controls, Administrative Controls and Personal Protective Equipment requirements have been identified and implemented.

Procedure:

Responsibilities

Management:

- Ensure complete & effective JHA's are developed for all production tasks
- Ensure JHA's are reviewed with new hires and annually thereafter
- Utilize JHA's and SOP's in accident investigations and retraining
- Ensure JHA's & SOP's are modified if a new step or process is added
- Ensure SOP's are developed for non-routine tasks that have a high degree of safety risk

Supervisors:

- Use JHA's and SOP's to train all new employees
- Use JHA's and SOP's when performing job performance evaluations
- Develop and submit JHA's for all tasks in their area of responsibility
- Review JHA's annually with all employees assigned to their department

The most important person in JHA process is the Supervisor, who is in constant contact with employees and should be familiar with the hazards in their Department. Supervisors are in a better position to recognize and correct unsafe acts and conditions as they occur.

Safety Coordinator:

- Assist Management and Supervisors in developing JHA's and SOPs
- Maintain a master file of all JHA's and SOPs
- Ensure new JHA's or SOPs are developed for new equipment or processes
- Ensure SOPs are posted for tasks that occur at fixed locations (i.e.. Bench Grinders, Boiler Operations, etc)

SOP Process

A Safe Operating Procedure consists of:

- A written step-by-step procedure for a specific task
- A description of possible hazards & cautions
- Hazard Control steps
- List of required personal protective equipment (PPE)
- Qualifications required for the operation

SOP's may be permanently posted or consist of multi-page instructions that are to be reviewed prior to each time a qualified person performs the task.

SOP's are developed and completed by the following steps:

1. Draft Development of SOPs
2. Review and approval of SOPs
3. Implementation of SOPs
4. Review and updating SOPs
5. Periodic Training using SOPs

JHA Process

A Job Safety Analysis consist of:

1. Job Physical Requirements
2. Job Environmental Conditions
3. Personal Protective Equipment required
4. Sequence of Basic Job Steps
5. Potential Accident or Hazards associated with each step
6. Safe Job Practice for each step

Job Safety Analysis are completed through the followings steps:

1. Development of JHA's
2. Review and approval of JHA's
3. Implementation of JHA's
4. Review and updating JHA's
5. Periodic Training using JHA's

Development of JHA/SOP

There are many ways to develop JHA/SOPs, however, observation and team approach has proven the most reliable. By watching the tasks, the observer can see first hand what is required, recognize the hazards and recommend alternatives. Below is the sequence used to develop a JHA/SOP:

1. Select the most experienced employee to observe
2. Explain the purpose of your observations
3. Observe the task and define the steps used to complete the assignment
4. Record the basic steps
5. Review the steps with the observed Employee for clarity

6. Observe the task a second time and identify any hazard potentials and record the findings. Hazard types include:
    a. Impact
    b. Contact with Chemicals
    c. Caught on or between
    d. Lacerations
    e. Burns
    f. Fall or Slip
    g. Over exertion
    h. Cumulative Trauma
7. Observe the task a third time to develop corrective measures to all hazard potentials
8. Review your findings with the Employee for clarity
9. Complete the JHA form or write SOP

Review and Approval of JHA/SOP's

After the draft copy of the JHA/SOP has been completed, it should be reviewed by a team consisting of the Safety Coordinator, Department Manager, Supervisor, and affected Employees. The team should discuss all questions. A final version is then drafted.

Implementation of JHA/SOP's

The Supervisor then reviews completed JHA/SOP's with the entire department. New hires and transfers should have the JHA/SOP's reviewed with them and made part of the Employee's job performance evaluation.

Updating JHA/SOP's

All new hazards, operations, equipment and tools should be updated on the JHA/SOP's and communicated to all Employees as soon as possible. JHA's will become out-dated if not reviewed periodically.

Periodic Training and Retraining

Annually, the Supervisors with all Employees should review the JHA/SOP's.
JHA/SOP's should be reviewed with the Employee during an accident investigation to help identify possible causes or problem areas.

Policy Number: SP100
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Contractor Safety

Purpose:

The Contractor Safety Program is designed to protect company and contractor employees, equipment and facilities from injury, accident or loss. Contractors are persons not directly employed by the Company who provide specific labor or services

Applicability:

Site management teams that utilize contractor services.

Procedure:

Examples of Contractor Employers are:

- Construction Companies
- Utility Service or Repair Companies
- Janitorial Services
- Pest Control Services
- Food Service and Vending Groups
- Transportation & Shipping Services
- Raw Product Suppliers

At times the Company uses contractors to perform specific duties outside the Company's scope of work. All contractors must comply with applicable local, state, federal regulatory requirements and our company safety procedures and policies. Specific compliance is required in the following:

Responsibilities

Management

- Ensure contracts for bids contain appropriate information concerning the Contractor Safety program including all requirements
- Provide access to MSDS material upon request of contractors
- Monitor all contractor activity at their location
- Ensure the area in which the contractor employees are working are maintained safe and free of hazards,
- Provide contractors with specific safety program requirements

Contractors

- Conduct daily safety inspections of all assigned areas
- Identify and correct hazards
- Provide contractor employees with required personal protective equipment
- Ensure Contractor Employees have the proper training for assigned tasks
- Coordinate with (Company) Safety Manager for safety related issues
- Maintain required insurance coverage
- Establish and maintain an effective Safety and Health Program
- Establish and maintain an effective Housekeeping Program

Minimum Insurance Requirements

Contractors and Vendors are required to meet minimum Insurance Requirements that are established by out clients. Before subcontracting any service the client representative must be consulted to determine the minimum coverage requirements for:

- Automobile Liability
- General Liability
- Products Liability
- Completed Operations Liability
- Workmen's Compensation

Certificates of Insurance

Contractors must provide the company a Certificate of Insurance. The Certificate must list the contractor, its Divisions and Subsidiaries as a Certificate Holder with notification of cancellation or non-renewal. Without the Certificate, the Company may have to assume the liabilities and responsibilities for the Contractor.

Training

Information and training is to be made available to contractors in the form of copies of written safety programs. Written programs from the Required Training list, based on hazard exposure, are to be presented to contractors.

Required Training for Contractor Employees

- General Safety Rules, including reporting of Unsafe Conditions
- Hazard Communication & chemical safety
- Lockout- Tagout
- Electrical Safety
- Evacuation Routes, Alarms & Procedures
- Hot Work Program
- Confined Space Program
- Process Safety Management
- Personal Protective Equipment
- Fall Prevention

Safety Reviews

A comprehensive pre-work safety review conference will be conducted for all contractor work that involves:

- Construction & renovation
- Equipment installation & repair
- Utility modifications
- Electrical & plumbing work
- Work at elevated locations
- Confined space entry
- Use of toxic substances
- Hot work or welding
- Work on systems covered by Process Safety Management 29 CFR 1910.119

Safety review participants will consist of company and contractor safety representatives. All task specific safety concerns shall be addressed and resolved prior to commencement of work by the contractor

Hazardous Chemical/Substance Notification

Contractor must follow the OSHA Hazard Communication Standard requirements including safe handling and storage of chemicals. Contractors are required to inform the Client of all hazardous substances which may be brought on to your sites property, including providing the most current Material Safety Data Sheet for each substance. All spills and leaks of hazardous chemicals must be immediately reported to the Site's environmental specialist and the Safety Manager.

Welding & Hot-Work Permit Program

All hot work and welding operations must be conducted under the control of a Hot Work Permit that has been pre-approved by the Company

Confined Space Entry

Contractor employees are not authorized to enter any confined spaces on all Company maintained property unless specifically required by the service or construction contract. If confined space entry is required, local management must ensure adherence to all requirements of 29 CFR 1910.146 by contractor personnel.

Work at Elevated Locations

All contractor employees when working at elevated locations shall use required fall protection equipment.

Other Policies and Procedures

All contractor employees shall adhere to all other (Client) Policies, including but not limited to: access to company facilities, company equipment, use of controlled substances, firearm & explosive restrictions, harassment of other persons, traffic and parking regulations.

Policy Number: SP110
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Safety Training

Purpose:

It is the policy of Triangle Services that training will be provided to all employees, which is designed to ensure the competency and safety of our work force. The training program will encompass new-hire orientation training, ongoing job skills training, training for the completion of non-routine tasks, and safety awareness training. Please consult with your management team for information about your ongoing job skills training program.

Applicability:

All Employees

Procedure:

New-Hire Orientation Training

Orientation training will be provided for all new employees. The training information will be site specific, as it will be designed to orient the new-hire to facility rules, regulations, procedures, configuration, management/client structure and safety awareness. It is mandatory that the orientation training is documented on the relevant Triangle Services Orientation Training form which can be found in the Forms section of this manual. An electronic version of the form can be obtained from the Director of Safety if customization is necessary for your facility. Any customizations must be approved for use by your Division/Regional Manager. Orientation training will consist of:

1. Facility Familiarization: This section of training will focus on facility rules and regulations (cell phone use, dress code, jewelry restrictions, smoking restrictions, etc..), layout of office and production areas, location of restrooms, locker rooms, break rooms and other employee use areas, and the location of critical utility disconnect devices.

2. Personnel Familiarization: This section will focus on contact phone numbers for the management team and client contacts, introduction to key personnel, and familiarization with the structure of the work center.
3. Procedure/Policy Familiarization: This section focuses on company policies and procedures, and work center policies and procedures.
4. Job Familiarization: This section focuses on a description of the areas and/or equipment that will be maintained, operated, monitored or otherwise utilized as a function of the job for which the employee was hired. The employee will be shown where work procedures are kept and how job tasks and assignments are distributed to the field. The employee will also be shown how work documentation is completed and the proper method of submitting the completed documentation to the management team.
5. Safety Orientation: The new employee is trained in all safety topics that are required to ensure the employee's safety in a new environment, and to fulfill OSHA mandates.

Hazards of Non-Routine Tasks

Specific training is required for all non-routine tasks that employees are asked to perform. A non-routine task is defined as a task for which an employee has not had previous training or instruction and is of limited duration. Both the supervisor and employee have the responsibility to recognize an assigned non-routine task. Once a non-routine task is identified, a Job Hazard Analysis (JHA) must be completed in order to develop a written procedure that details all of the steps required to properly complete the task, identify possible hazards, and list PPE that should be utilized to reduce or eliminate the hazards. An example of a Job Hazard Analysis has been included in the Forms sections of this manual.

Safety Awareness Training

Safety awareness is an ongoing process that must be reinforced throughout the career of each employee at Triangle Services, and its' affiliated companies. It is the responsibility of the management team to provide safety training to the workforce so that all employees are aware of the hazards present in their workplace and the procedure/policies, and PPE available to reduce or eliminate these hazards. It is the employees' responsibility to always be aware of the present hazards and to abide by all of the policy/procedure requirements that have been put in place to ensure their safety.

Ongoing safety training is an integral part of providing the needed safety awareness that the employees of Triangle Services, and its' affiliated companies, deserve. Some safety topics are required to be conducted annually, when workplace changes occur, when job responsibilities change, or when the management team deems refresher training necessary.

Table 1, below, explains when specific training topics are required to be conducted, in accordance with OSHA standards. These OSHA mandates make up the core of the safety training program.

Table 2 is a quick reference that demonstrates which training requirements are applicable to each of the operating divisions within Triangle Services, and its' affiliated companies. This table includes the OSHA requirements referenced in Table 1, as well as requirements for airport ramp operations that are in place due to FAA regulations.

Table 1

	At time of hire	Employees responsibility changes	When plan /procedure changes	Annually	When Equipment Changes	As needed per manager directive	Certification required	Before Initial Use	
Emergency Action Plan	X	X	X			X			1910.38
Fire Safety and Prevention	X					X			1910.38
Powered Platforms and Lifts		X	X		X	X	X		1910.66
Personal Fall Arrest System					X	X		X	1910.66 apx C
Hearing Protection	X	X		X*		X			1910.95
Bloodbourne Pathogens	X	X		X		X			1910.1030
Handling of liquefied petroleum gases	X	X	X		X	X			1910.11
Personal Protective Equipment	X	X	X		X	X	X		1910.132
Respirators	X	X	X		X	X	X		1910.134
Permit required confined spaces	X	X	X		X	X	X		1910.146
Control of hazardous energy sources, LOTO	X	X	X		X	X	X		1910.147
Medical services and first aid						X			1910.151
Fire Extinguishers	X			X		X			1910.157
Powered industrial trucks***	X	X	X		X	X	X		1910.178
Work on or near energized equipment	X	X				X	X		1910.332 & NFPA 70 E
Hazard Communication	X		X**			X			1910.1200

* Training is required annually if an OSHA mandated Hearing Conservation program is in place.
** For hazard communication, the plan/procedure is considered to be changed with the introduction of new chemicals to the facility.
*** Powered Industrial Trucks include forklifts, belt loaders, tugs, container/pallet loaders, push backs

Table 2

	Janitorial	Mechanical/ Electrical	Passenger Services	Ramp	Security
Scaffolding	X	X			
Emergency Action Plan	X	X	X	X	X
Fire Safety and Prevention	X	X	X	X	X
Powered Platforms and Lifts		X		X	
Personal Fall Arrest System		X		X	
Hearing Protection	X	X		X	X
Bloodbourne Pathogens	X	X	X	X	X
Jetway Operation				X	
Compressed gases, general requirements		X			
Personal Protective Equipment	X	X	X	X	X
Respirators	X	X			
Control of hazardous energy sources, LOTO		X			
Medical services and first aid	X	X	X	X	X
Fire Extinguishers	X	X	X	X	X
Powered industrial trucks		X		X	X
Ground Communication (Hand Signals)				X	
Hazard Communication	X	X	X	X	X
Handling of liquefied petroleum gases		X		X	X
Dangerous Goods Training				X	
Work on or near energized equipment		X			
AOA Vehicle Operation				X	

In addition to the above documented safety training requirements, training covering back safety and lifting technique and slips trips and falls need to be conducted frequently. These two safety issues consistently account for the top two in the number of occurrences, employee lost days and expense to the company. Each work center is responsible to provide training in these two additional areas so that employees are aware of these hazards and are prepared to avoid injury.

Tailgate Meetings

Each Branch shall conduct "tailgate meetings" with employees as a means of reinforcing safety procedures and/or to discuss any known deficiencies or knowledge of any potential safety hazards. Unlike the formal nature of the monthly safety meeting, tailgate meetings are to be held informally at the beginning or end of the shift. These meetings should not exceed fifteen minutes in length and shall take place every two weeks. Topics for discussion are provided by the branch Safety Officer (retrieved online and/or presented by corporate office) and it is strongly encouraged that each branch tailor these meetings to their operational needs and/or present safety concerns. All meetings must be documented on a safety training certification form, located in the forms section of this manual.

SECTION II: SPECIFIC SAFETY TOPICS

Procedure #	Policy Description
SP120	Bloodborne Pathogens
SP130	Hazard Communication
SP140	Personal Protective Equipment (PPE)
SP150	Respiratory Protection
SP160	Fire Safety
SP170	Slips, Trips and Falls
SP175	Ladder and Scaffolding Safety
SP180	Fall Protection
SP185	Electrical Safety
SP190	Lockout/Tagout
SP200	Boiler Safety
SP210	Compressed Gas
SP220	Confined Space
SP230	Excavation
SP240	Hearing Conservation
SP250	Forklifts
SP260	Heat Preparedness
SP270	Cold Weather Safety
SP280	Hot Work Safety
SP290	Housekeeping
SP300	Machine Guarding and Operational Checks
SP310	Office Safety
SP320	Storage of Flammables
SP330	Tool Safety
SP340	Asbestos Awareness
SP350	Vehicle Safety and Fleet Policy

Policy Number: SP120
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Bloodborne Pathogens Written Procedure

Purpose:

An infection control plan has been prepared for all persons who handle, store, use, process, or dispose of potentially infectious wastes. This infection control plan complies with OSHA requirement, 29 CFR 1910.1030, Blood Borne Pathogens. The plan includes requirements for personal protective equipment, housekeeping, training, and a procedure for reporting exposures.

Applicability:

- The Bloodborne Pathogen Program will be administered by the local safety representative(s), which includes training, inspections, audits, and providing proper PPE.
- Management will ensure proper conduct of the program through inspections, record keeping and periodic audit.
- Employees are responsible for following all of the policies and procedures that have been implemented for the purpose of avoiding contact with bloodborne pathogens.

Procedure:

Definitions

Biological Hazard. The term biological hazard or biohazard is taken to mean any viable infectious agent that presents a risk, or a potential risk, to the well being of humans.

Medical Wastes/Infectious Wastes. All waste emanating from human or animal tissues, blood or blood products or fluids. This includes used first aid bandages, syringes, needles, sharps, material used in spill cleanup and contaminated PPE or clothing.

Universal Precautions. Refers to a system of infectious disease control that assumes that every direct contact with body fluids is infectious and requires every employee exposed to be protected as though such body fluids were infected with blood-borne pathogens. All infectious/medical material must be handled according to Universal Precautions (OSHA Instruction CPL 2-2.44A)

Hazards

Unprotected exposure to body fluids presents the possible risk of infection from a number of bloodborne pathogens notably Hepatitis and HIV.

Hazard Control

Engineering Controls - prevention of exposure to bloodborne pathogens engineering controls include proper storage facilities for equipment used in clean up of Blood and other hazardous waste.

Administrative Controls - prevention of exposure to bloodborne pathogen administrative controls include universal precautions, assignment of PPE, employee training, use of spill kits specifically designed for blood and body fluids, restricted access to waste collection points and waste disposal procedures.

Reporting and Record Keeping

Any reports required by OSHA will be maintained by the Occupational Health Department. All reports (Training Certificates, Notice of HBV Vaccinations, exposure reports) will be maintained for 30 years. Occupationally contracted HBV or HIV will be recorded on the OSHA 200 Log of Occupational Injuries and Illnesses as an illness. Exposures to blood-borne pathogens from contact with sharp objects will be recorded on the OSHA 200 Log of Occupational Injuries and Illnesses, if treatment such as gamma globulin, hepatitis B immune globulin or hepatitis B vaccine is prescribed by a Physician.

Training

All Triangle Services and affiliated companies personnel who may have a reasonable expectation of coming into contact with infectious wastes will receive initial and annual training by the site safety representative for the Bloodborne Pathogen Program. This would include :

- Janitorial personnel
- Mechanics and technicians
- Security personnel
- Ramp ops personnel
- Passenger Service Personnel

Additionally, all personnel trained in First Aid shall be offered this annual training. All new and current affected Employees will be trained initially and annually thereafter. The content of the training program will include:

1. Company Policy
2. Types and transmission of Blood-Borne Pathogens
3. General Safety Rules
4. Universal Precautions
5. Use of Personal Protective Equipment
6. Medical Waste Disposal Procedures
7. Post Exposure Treatment and Procedures
8. HBV Vaccinations

Documentation of training will be by *Control of Blood-Borne Pathogens Training Certificate.*

All Employees not affected by this Program will receive an overview of the program requirements during scheduled department Safety Meetings with documentation by Safety Meeting Certification Form.

Hepatitis-B Virus (HBV) Vaccinations

Employees who have a reasonable expectation of coming into contact with infectious wastes will be offered Hepatitis-B Virus (HBV) Vaccinations at Company expense. Employees that transfer to a job or their job is reclassified to include exposure to blood-borne pathogens will be offered HBV Vaccinations within 10 working days of the transfer or reclassification.

The choice for HBV vaccination is not mandatory. If an affected Employee chooses not to have the vaccination at the initial offering, they will have the opportunity to be vaccinated when they are ready. The Company will document the offer, acceptance or declination, and vaccination dates with the *Notice of HBV Vaccinations Form*.

Post Exposure Treatment and Notification Procedures

Should an affected Employee or an Employee acting as a "Good Samaritan" be occupationally exposed to HIV/HAV/HBV the affected Employee will report the exposure to Management. The Company will provide for the Employee to be tested for HIV/HAV/HBV at Company expense. Following the initial blood test at time of exposure, seronegative Employees will be retested at 6 weeks, 12 weeks and 6 months to determine if transmission has occurred. During this period, the Employee will follow the recommendations provided by the Physician or the U. S. Public Health Service.

An "occupational exposure" is defined as blood or body fluid contact from an injured or ill Employee to the affected Employee or injury by a contaminated sharp object. Following the report of exposure, Management will contact the exposure source and request that person be tested for HIV/HAV/HBV at Company expense. The request is not mandatory, and if refused will not effect that Employee's future employment.

The source individual's blood is tested as soon as possible and after consent is obtained to determine HBV and HIV infectivity. (Hepatitis B surface Antigen, Hepatitis C Antibody and HIV Screen)

The exposed employee's blood shall be collected as soon as feasible and tested for HBV (Hepatitis Bs Antibody, Hepatitis C Antibody) and HIV serological status after consent is obtained (Employee Consent for HIV Antibody Testing).

During all phases of Post Exposure, the confidentiality of the affected Employee and exposure source will be maintained on a "need to know basis". The *Blood-Borne Pathogens Exposure and Treatment* form is used to document the exposure and offer of medical assistance to the affected Employee and use the *Medical Consent for Blood-Borne Pathogens Testing* form for the exposure source. The results of any HIV/HAV/HBV tests conducted will be provided to the exposed and source Employees within 5 business days of receipt.

General Procedures

Gloves must be made of appropriate disposable material, usually intact latex or vinyl. They must be used in the following circumstances:

- When the employee has cuts, abraded skin, chapped hands, dermatitis, or similar conditions.
- When examining abraded or non-intact skin of a patient with active bleeding.
- While handling blood or blood products or other body secretions during routine laboratory procedures.

Employees must wash their hands immediately, or as soon as possible, after removal of gloves or other personal protective equipment and after hand contact with blood or other potentially infectious materials.

All personal protective equipment must be removed immediately upon leaving the work area, and if this equipment is overtly contaminated, it must be placed in an appropriate area or container for storage, washing, decontamination, or disposal.

Contaminated clothing must not be worn in clean areas or outside the building.
All procedures involving blood or other potentially infectious agents must be performed in a manner that will minimize splashing, and spraying.

Medical Wastes

Medical/infectious waste must be segregated from other waste at the point of origin. Medical/infectious waste, except for sharps (i.e., razor blades, broken glass, needles, etc.) capable of puncturing or cutting, must be contained in double disposable red bags conspicuously labeled with the words "INFECTIOUS WASTE" and "BIOHAZARD." Used needles or other sharps (razor blades, broken glass, scalpels, etc.) must not be sheared, bent, broken, recapped, or sheathed.

Infectious sharps must be contained for disposal in leak-proof, rigid puncture-resistant containers. Infectious waste contained as described above must be placed in reusable or disposable leak-proof bins or barrels that are conspicuously labeled with the words "INFECTIOUS WASTE" and "BIOHAZARD." These waste barrels are picked up regularly by an outside company licensed to handle infectious wastes.

All infectious agents, equipment, or apparatus must be disinfected in an autoclave or otherwise disinfected before being washed or disposed of. Each individual working with infectious bio-hazardous agents is responsible for disinfection and disposal of these agents.

Biological wastes that do not contain radioactive or hazardous substances may be disinfected by steam sterilization (autoclave) then disposed of in the regular trash. Liquid bio-hazardous waste may be disposed of in the sewage system following chemical decontamination.

Reusable glassware must be decontaminated in household bleach solution (1:9) prior to rinsing and acid washing. The glassware must then be sterilized in an autoclave.
To minimize the hazard to firefighters or emergency response personnel, at the close of each work day and before the building is closed, all infectious or toxic material must be placed in a refrigerator, placed in an incubator, or autoclaved or otherwise disinfected. Infectious agents must not be placed in an autoclave and left overnight in anticipation of autoclaving the next day.

Floors, laboratory benches, and other surfaces in buildings where infectious agents are handled must be disinfected with a suitable germicide, such as 1:9 sodium hypo chlorite solution (household bleach) as often as necessary as determined by the supervisor. Infectious agents must not be dumped into the building drainage system without prior disinfection.

Cuts

If an employee has a needle stick, cut, or mucous membrane exposure to another person's body fluids, he/she must report the incident immediately to his immediate supervisor.

Blood Exposure

All employees exposed to human blood and blood products must report to the Site Manager for information and possible inclusion in the Hepatitis B Immunization Program.

Infection Control Plan

The purpose of the Infection Control Plan is to protect the health and safety of the persons directly involved in handling the materials, Company personnel and the general public by ensuring the safe handling, storage, use, processing, and disposal of infectious medical waste. This plan complies with OSHA requirement proposed for 29 CFR 1910.1030, Bloodborne Pathogens.

Universal Precautions

Refers to a system of infectious disease control that assumes that every direct contact with body fluids is infectious and requires every employee exposed to be protected as though such body fluids were infected with blood-borne pathogens. All nfectious/medical material must be handled according to Universal Precautions (OSHA Instruction CPL 2-2.44A).

The following universal precautions must be taken:

Gloves must be made of appropriate disposable material, usually intact latex or vinyl.

They must be used:

1. When the employee has cuts, abraded skin, chapped hands, dermatitis, or the like.
2. When examining abraded or non-intact skin of a patient with active bleeding.
3. While handling blood or blood products or other body secretions during routine procedures.
4. Gowns, aprons, or lab coats must be worn when splashes of body fluid on skin or clothing are possible.
5. Mask and eye protection are required when contact of mucosal membranes (eyes, mouth or nose) with body fluids is likely to occur (e.g. splashes).
6. Resuscitation equipment, pocket masks, resuscitation bags, or other ventilation equipment must be provided to eliminate the need for direct mouth-to-mouth

contact. If Site presumes the need for such equipment, Safety coordinator will be notified.

Waste Disposal Plan

1. Medical/Infectious waste must be segregated from other waste at the point of origin.
2. Medical/Infectious waste, except for sharps (e.g. razor blades, broken glass, needles, etc.) capable of puncturing or cutting must be contained in double disposable red bags conspicuously labeled with the words, "INFECTIOUS WASTE -- BIOHAZARD."
3. Infectious sharps must be contained for disposal in leak-proof, rigid puncture resistant containers.
4. Infectious waste thus contained as described in procedures 2 and 3 above must be placed in reusable or disposable leak-proof bins or barrels which must be conspicuously labeled with the words, "INFECTIOUS WASTE -- BIOHAZARD." These waste barrels are be picked up regularly by an outside company licensed to handle infectious wastes.
5. Spills/Disinfectants: a solution of sodium hypo chlorite (household bleach) diluted 1:9 with water must be used to disinfect, following initial cleanup of a spill with a chemical germicide approved as a hospital disinfectant. Spills must be cleaned up immediately.
6. After removing gloves, and/or after contact with body fluids, hands and other skin surfaces must be washed thoroughly and immediately with soap or other disinfectant in hot water.
7. Other biological wastes that do not contain radioactive or hazardous substances may be disinfected by steam sterilization (autoclave) and then disposed of in the regular trash.
8. Liquid biohazard waste may be disposed of in the sewage system following chemical decontamination.
9. Reusable glassware must be decontaminated in sodium hyper chlorite (household bleach) solution (1:9) prior to rinsing and acid washing. Then the glassware must be sterilized in an autoclave.

Personal Protective Equipment for Worker ProtectionAgainst HIV and HBV Transmission

TASK	GLOVES	APRON	MASK	EYEWEAR
Control of Bleeding w/ spurting blood	X	X	X	X
Bleeding control with minimal bleeding	X			
Emergency Child Birth	X	X	X	X
Blood Drawing	X			
Handling & Cleaning Instruments	X			
Cleaning Bio Spills	X			
Taking Temperature				
Giving Injection	X			
Measuring Blood Pressure				

The examples provided in this table are based on application of universal precautions. Universal precautions are intended to supplement rather than replace recommendation for routine infection control, such as hand washing and using gloves to prevent gross microbial contamination of hands (e.g., contact with urine or feces).

Blood-Borne Pathogen Control
Universal Precautions and General Safety Rules
For Posting

Exposure Determination: Triangle Services and its' affiliated companies will not perform invasive medical treatment or provide intravenous medication. Therefore, the exposure to Blood-Borne Pathogens, as defined in item # 3 below, is determined to be from routine and emergency first aid treatment of common workplace injuries, or cleanup/removal of human bodily fluids. The following Universal Precautions and General Safety Rules have been established to prevent the spread of viral and bacterial organisms (namely HIV/HAV/HBV). In all cases, the Universal Precautions and General Safety Rules should be followed.

1. Before and immediately after providing first aid or cleanup/removal of bodily fluids, wash exposed areas (hands, arms, etc.) with antibacterial soap.
2. Don and use the required personal protective equipment for the task performed as outlined in the Personal Protective Equipment for Worker Protection Poster.
3. Treat all human body fluids and items soiled with human body fluids (blood, blood products, seamen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, concentrated HIV/HAV/HBV, and saliva as if contaminated with HIV/HAV/HBV. (Note: Feces, urine, nasal secretions, sputum, sweat, tears, or vomitus need not be treated as contaminated unless they contain visible blood)

(syn·o·vi·a (sī-nō'vē-ə) *n.*
A clear, viscid lubricating fluid secreted by membranes in joint cavities, sheaths of tendons, and bursae.

4. To avoid special handling, all clothing contaminated with human body fluid will be presoaked (sprayed on the affected areas) with the antibacterial/viral solution before being sent to the laundry. (Note: Gloves and eye protection should be worn when handling contaminated clothing until presoaked for 10 minutes)
5. Any spills of body fluid will be presoaked (sprayed on the affected area) with antibacterial/viral solution for 10 minutes before being removed. (Note: Gloves and eye protection should be worn when handling spills of body fluids)
6. Medical Wastes (those soiled with covered human body fluids) will be treated following the Medical Wastes Treatment and Disposal Procedures before being discarded as ordinary wastes.
7. Any suspected exposure to HIV/HAV/HBV by human body fluid contact (via broken skin, human bites, needle sticks, etc.) should be reported to your Supervisor immediately.

Control of Blood-Borne Pathogens Program
Medical Waste Treatment and Disposal Procedures
For Posting

1. All Medical Wastes (those soiled or covered with human body fluids) will be placed in a red leak-proof container marked either *Biohazard or Medical Waste*. All other wastes will be discarded following customary procedures. (Note: Soiled feminine hygiene/sanitary napkins, soiled facial tissues, etc. are not considered a biohazard or medical waste. Pretreatment is not necessary; however, Employees should wear personal protective equipment and wash hands with antibacterial soap afterwards)
2. Don and use the required personal protective equipment when handling medical wastes as outlined in the *Personal Protective Equipment for Worker Protection* Poster.
3. At the end of each shift, all accumulated medical wastes will be treated to remove biohazards using the following procedure:
    - Prepare a solution of 10 percent chlorine bleach to water (approximately 2 cups chlorine bleach to 1 gallon of water).
    - Pour solution over the medical wastes and thoroughly saturate.
    - Let stand for 10 minutes and then drain into sink.
    - Discard as ordinary wastes.
    - Caution: Sharp objects (broken glass, hypodermic needles, etc.) should not be handled by hand to prevent accidental punctures and lacerations.
4. Rinse medical wastes container and return for use again.
5. Wash hands and exposed areas with antibacterial soap.

Policy Number: SP130
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Hazard Communication Program

Purpose:

The objective of this program is to set forth policies and procedures concerning Hazard Communications which will enhance the safety and well being of Triangle Services employees. Furthermore, execution of this program is designed to provide for compliance with the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard, 29 CFR 1200.

Applicability:

All Employees

Procedure:

Responsibilities

Each facility (area of operations) will identify a Hazard Communication Officer. This position carries the responsibility of insuring this program is adhered to and that proper reporting is executed. This person will be identified on the Cover Sheet of the Hazard Communications binder.

Program

The ensuing items are to be followed to insure both compliance with the OSHA Hazard Communication Standard and the safety of our employees.

A. Hazardous Chemical List

A list of hazardous materials and chemicals which are used in the course of the company's normal business activities must be maintained and continually updated. This list is to include all substances which require a Material Safety Data Sheet (MSDS). Additionally, this list will serve as the MSDS binder Index

sheet, as the position of the chemical on the list will correspond to the position of the MSDS sheets in the binder. Each MSDS sheet will be separated by a divider with a numbered tab that corresponds to the chemical number listed on the Hazardous Chemical List (Index Sheet).

One copy of this list is to be kept in the front of each MSDS book and one copy is to be kept on file with the Hazard Communication Officer. For each chemical used in the workplace, an MSDS sheet must be available on that jobsite.

B. Material Safety Data Sheets (MSDS)

All Material Safety Data Sheets must be kept in the Hazard Communication binder, in the same order as listed on the Hazardous Chemical List (Index Sheet), located immediately in front of the Material Safety Data Sheets. The Hazard Communication binder shall be identified and placed in an accessible location for all employees to view at will. A duplicate set of MSDS information must be maintained by the Hazard Communication Officer.

MSDS books and the Hazardous Chemical List must be maintained and kept up to date. A Hazard Communication Cover Sheet will be placed in the Hazard Communication Manual, immediately in front of the Hazardous Chemical List (Index Sheet). The cover sheet will contain the name of the company, name of operating facility(ies), name of the Hazard Communication Officer, the last date the manual was audited and updated. As obsolete MSDS's are replaced by updated copies, they must be retained in a separate file of obsolete MSDS's. Do not throw them away.

If a hazardous chemical or substance is received without a proper MSDS, the receiving person must immediately notify the Hazard Communication Officer. The manufacturer or distributor of the product must be contacted immediately and asked to fax the MSDS and mail a copy as a follow up. If, for some reason, the manufacturer or distributor is unable to produce a MSDS upon request, the Hazard Communication Officer should be notified immediately. Hazardous materials or substances received without an MSDS are to be returned to the sender.

C. Labeling

Each container of a hazardous chemical that is used in or around the work area must be properly labeled with the identity of the hazardous material, the appropriate hazard warnings, and the name and address of the manufacturer. Appropriate labels must be on all containers, regardless of size. Containers must be approved and recommended for storage and/or dispensing of the particular hazardous chemicals contained in them.

Worn and torn labels must be replaced. It is the responsibility of employees to report inappropriate labels to their supervisor. It is the responsibility of the Hazard Communication Officer to insure that appropriate labels are in place and that replacement labels are available.

Portable containers for materials do not require a label, provided all of the following requirements are met:

1. The portable container is filled from a properly labeled container
2. All of the contents of the portable container are used on the same shift, by the employee who transferred the chemicals.
3. The unlabeled, portable container is not left unattended during the shift.

D. Training

Employee training for this Hazard Communication Program consists of the following:

1. Each affected employee working for, or associated with, Triangle Services is required to review the training material with the Hazard Communication Officer and sign the acknowledgment form which will be placed in the employee's file. This training is to be done during the new employee orientation process before the new employee actually assumes status as an active employee. In addition to this training, affected employees must be shown the locations of Material Safety Data Sheets, fire extinguishers, first aid kits, and usage and storage of hazardous materials.

2. Fire extinguisher training may be provided to designated employees. An acknowledgment form must be signed by the employee and filed for documentation purposes. Employees to be trained are those employees who work in a facility where an attempt to fight a small fire, utilizing a fire extinguisher, is a part of the facility fire fighting policy.

3. First Aid and CPR training will be provided as required in 29 CFR 1910.151. An acknowledgment form must be signed by the employee and filed for documentation purposes.

4. If the management of Triangle Services engages the services of contract labor personnel, and exposure to hazardous materials is possible, the contract laborers must be made aware of the locations of the Hazardous Chemical List and the MSDS information book.

E. Storage

All storage areas for hazardous substances are to be secured, properly ventilated, and identified by signs.

F. Non-Routine Tasks

Before any non-routine task is performed, employees shall be advised and/or they must contact the responsible manager for special precautions to follow and the responsible manager shall inform any other personnel who could be exposed. (No non-routine tasks are known to exist at the time of preparation of this program.)

If a non-routine task is necessary, the responsible manager will provide the following information about the activity as it relates to the specific chemicals expected to be encountered:

1. specific chemical name(s) and hazard(s);
2. personal protective equipment required and safety measures to be taken;
3. the location and contents of the MSDS for the non-routine chemicals to be used.
4. measures that have been taken to lessen the hazards including ventilation, respirators, presence of other employees(s); and
5. emergency procedures.

G. Other Personnel Exposures (Contractors)

The responsible manager will provide other personnel or outside contractors with the following information as follows:

1. hazardous chemicals to which they may be exposed to while in the workplace;
2. measures to minimize the possibility of exposure;
3. location of the MSDS and labeling requirements for all hazardous chemicals; and
4. procedures to follow if they are exposed.

The responsible manager will contact each contractor before work is started to gather and disseminate any information concerning chemical hazards the contractor is bringing into the workplace, and visa versa.

H. Program Compliance

Any direct or intentional violation or non-compliance with this program may result in the termination of the person or persons involved, in accordance with company policy.

I. Definitions

1. **Hazardous Chemical: Any element, chemical compound, or mixture of elements and/or compounds which is a physical hazard or a health hazard. The standard applies to all hazardous chemicals regardless of**

the quantity. A chemical is considered hazardous if it is listed in any of the following:

- OSHA, 29 CFR 1910.1000 Table Z-l through Z-3
- Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment ACGIH (latest edition)
- The Registry of Toxic Effects of Chemical Substances NIOSH (latest edition)

2. Physical Hazard: A hazard created by a chemical or material external to the human body, such as a flammable, corrosive, or explosive material.

3. Health Hazard: A hazard created by a chemical or material within the human body, and can result in headaches, nausea, cancer, lung damage, dermal irritation or even reproductive damage

4. Acute: Damage that is quickly done to the human body. Short term exposure.

5. Chronic: Damage that is done to the human body over a long period of time. Long term exposure.

Policy Number: SP140
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Personal Protective Equipment (PPE) Written Plan

Purpose:

The Company provides all Employees with required PPE to suit the task and known hazards. This Chapter covers the requirements for Personal Protective Equipment with the exception of PPE used for hearing conservation and respiratory protection or PPE required for hazardous material response to spills or releases, which are covered under separate programs.

Applicability:

All Employees

Procedure:

General Policy

Engineering controls shall be the primary methods used to eliminate or minimize hazard exposure in the workplace. When such controls are not practical or applicable, personal protective equipment shall be employed to reduce or eliminate personnel exposure to hazards. Personal protective equipment (PPE) will be provided, used, and maintained when it has been determined that its use is required and that such use will lessen the likelihood of occupational injuries and/or illnesses.

Responsibilities

Management

- Conduct hazard assessments to identify specific PPE for specific tasks
- Train employees in the selection, use, inspection, storage, cleaning, and limitations of specific PPE

Supervisors

- Monitor use of PPE
- Provide replacement PPE when needed
- Identify any new hazards that would require the use of PPE

Employees

- Properly use and care for assigned PPE
- Immediately inform supervisor if PPE is damaged or not effective

General Rules

Design

All personal protective clothing and equipment will be of safe design and construction for the work to be performed. Only those items of protective clothing and equipment that meet National Institute of Occupational Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards will be procured or accepted for use.

Hazard Assessment and Equipment Selection

It is the policy of Triangle Services that a site hazard assessment will be conducted at each facility from which a work center conducts operations, on an annual basis. The intent of this assessment is to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the site management team shall

- Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment. All hazards that are identified.
- Communicate selection decisions to each affected employee; and,
- Select PPE that properly fits each affected employee.

Each work center shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment.

Procedure

Using the Certification of Hazard Assessment form, read each of the listed tasks and determine if they apply to the facility under assessment. If it is determined that a particular task applies to the facility under assessment, place an “x” in the first column, which is labeled “TASK”. When an “x” is placed in the task column, a corresponding “x” will appear under each type of Personal Protective Equipment that is needed to provide protection against potential hazards. If the “x” is black in color, the identified PPE is

mandatory, and if the "x" is red in color the identified PPE is highly recommended in order t o offer employees the best protection from potential hazards.

If additional tasks, that may present potential hazards, are identified at the facility under assessment, which do not appear on the Certification of Hazard Assessment form, use the table provided on page three of the form to document these tasks.

- Column 1: Additional Tasks- Briefly describe the task that may represent potential hazards.
- Column 2: Potential Hazards- Briefly describe any potential hazard(s) that the employee is likely to be exposed to during the proper completion of the identified task.
- Column 3: Recommended PPE- List all PPE items that could be used to minimize or eliminate the potential hazards that have been identified.

Complete the certification section on page three of the form. This section must be completely filled out in order to meet OSHA 1910.132 requirements. Once the form has been completed, print it out and sign it. Use it as a checklist to obtain all identified PPE. Retain the signed copy at the facility for which the assessment was completed. Forward the completed form (without signature) via e-mail to the Director of Safety, at jwoodings@maintech-corp.com.

Defective and damaged equipment:

Defective or damaged personal protective equipment shall not be used.

Employee Training

Triangle Services will provide training to each employee who is required to use PPE.
All Employees who are required to use PPE shall be trained to know at least the following:

(i) When PPE is necessary;

(ii) What PPE is necessary;

(iii) How to properly don, remove, adjust, and wear PPE;

(iv) The limitations of the PPE

(v) The proper care, maintenance, useful life and disposal of the PPE.

Each affected Employee will demonstrate an understanding of the training and the ability to use PPE properly, by the successful completion of a written exam and demonstration of PPE use to their supervisor, before being allowed to perform work requiring the use of PPE.

Certification of training for PPE is required by OSHA and shall be accomplished by using the *Job Safety Checklist* to verify that each affected Employee has received and understood the required PPE training.

When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required to properly use assigned PPE the employee's manager or supervisor will provide and document remedial training. Circumstances where remedial training is required include, but are not limited to, situations where:

(i) Changes in the workplace render previous training obsolete; or

(ii) Changes in the types of PPE to be used render the previous training obsolete; or

(iii) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

Triangle Services requires each work center management team to maintain training records to verify that all employees have received the required training for use of PPE as detailed by this procedure. The employer shall verify that the affected employee has received and understood the required training through a written certification (FM-OPR-TR-07) that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the certification.

PPE Selection

Controlling hazards

PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound manufacturing practices.

Selection guidelines

The general procedure for selection of protective equipment is to:

1. Become familiar with the potential hazards and the type of protective equipment that is available, and what it can do; i.e., splash protection, impact protection, etc.;
2. Compare the hazards associated with the environment; i.e., impact velocities, masses, projectile shape, radiation intensities, with the capabilities of the available protective equipment;
3. Select the protective equipment, which ensures a level of protection greater than the minimum required to protect employees from the hazards
4. Fit the user with the protective device and give instructions on care and use of the PPE. It is very important that end users be made aware of all warning labels for and limitations of their PPE.

Fitting the Device

Careful consideration must be given to comfort and fit. PPE that fits poorly will not afford the necessary protection. Continued wearing of the device is more likely if it fits the wearer comfortably. Protective devices are generally available in a variety of sizes. Care should be taken to ensure that the right size is selected.

Devices with adjustable features

Adjustments should be made on an individual basis for a comfortable fit that will maintain the protective device in the proper position. Particular care should be taken in fitting devices for eye protection against dust and chemical splash to ensure that the devices are sealed to the face. In addition, proper fitting of helmets is important to ensure that it will not fall off during work operations. In some cases a chinstrap may be necessary to keep the helmet on an employee's head. (Chinstraps should break at a reasonably low force, however, so as to prevent a strangulation hazard). Where manufacturer's instructions are available, they should be followed carefully.

Eye and Face Protection

The majority of occupational eye injuries can be prevented by the use of suitable/approved safety spectacles, goggles, and shields. Approved eye and face protection shall be worn when there is a reasonable possibility of personal injury.

- Each employee shall use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.
- Each employee shall use eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors are acceptable.
- Each employee who wears prescription lenses while engaged in operations that involve eye hazards shall wear eye protection that incorporates the prescription in its design, or shall wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.
- Eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer.
- Each employee shall use equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation.

Typical hazards that can cause eye and face injury are:

- Splashes of toxic or corrosive chemicals, hot liquids, and molten metals;
- Flying objects, such as chips of wood, metal, and stone dust;
- Fumes, gases, and mists of toxic or corrosive chemicals; and
- Aerosols of biological substances.

Prevention of eye accidents requires that all persons who may be in eye hazard areas wear protective eyewear. This includes employees, visitors, contractors, or others passing through an identified eye hazardous area. To provide protection for these personnel, work activities shall procure a sufficient quantity of heavy-duty goggles and/or plastic eye protectors, which afford the maximum amount of protection possible. If these personnel wear personal glasses, they shall be provided with a suitable eye protector to wear over them.

Eye / Face Protection Specifications

Eye and face protectors procured, issued to, and used by employees, contractors and visitors must conform to the following design and performance standards:

a) Provide adequate protection against the particular hazards for which they are designed

b) Fit properly and offer the least possible resistance to movement and cause minimal discomfort while in use.

c) Be durable.

d) Be easily cleaned or disinfected for or by the wearer.

e) Be clearly marked to identify the manufacturer.

Persons who require corrective lenses for normal vision, and who are required to wear eye protection, must wear goggles or spectacles of one of the following types:

1) Spectacles with protective lenses, which provide optical correction.

2) Goggles that can be worn over spectacles without disturbing the adjustment of the spectacles.

3) Goggles that incorporate corrective lenses mounted behind the protective lenses.

<u>Eye & Face Protector Use</u>

Safety Spectacles: Protective eye glasses are made with safety frames, tempered glass or plastic lenses, temples and side shields which provide eye protection from moderate impact and particles encountered in job tasks such as carpentry, woodworking, grinding, scaling, etc.

Single Lens Goggles: Vinyl framed goggles of soft pliable body design provide adequate eye protection from many hazards. These goggles are available with clear or tinted lenses, perforated, port vented, or non-vented frames. Single lens goggles provide similar protection to spectacles and may be worn in combination with spectacles or corrective lenses to insure protection along with proper vision.

Welders/Chippers Goggles. These goggles are available in rigid and soft frames to accommodate single or two eyepiece lenses.

1. Welders goggles provide protection from sparking, scaling or splashing metals and harmful light rays. Lenses are impact resistant and are available in graduated shades of filtration.
2. Chippers/grinders goggles provide eye protection from flying particles. The dual protective eye cups house impact resistant clear lenses with individual cover plates.

Face Shields. These normally consist of an adjustable headgear and face shield of tinted/transparent acetate or polycarbonate materials, or wire screen. Face shields are available in various sizes, tensile strength, impact/heat resistance and light ray filtering capacity. Face shields will be used in operations when the entire face needs protection and should be worn to protect eyes and face against flying particles, metal sparks, and chemical/ biological splash.

Welding Shields. These shield assemblies consist of vulcanized fiber or glass fiber body, a ratchet/button type adjustable headgear or cap attachment and a filter and cover plate holder. These shields will be provided to protect workers' eyes and face from infrared or radiant light burns, flying sparks, metal spatter and slag chips encountered during welding, brazing, soldering, resistance welding, bare or shielded electric arc welding and oxyacetylene welding and cutting operations.

Filter Lenses for Protection Against Radiant Energy

Operations	Electrode Size 1/32 in	Arc Current	Protective Shade
Shielded metal arc welding	Less than 3	Less than 60	7
	3-5	60-160	8
	5-8	160-250	10
	More than 8	250-550	11
Torch brazing			3
Torch soldering			2

Note: as a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade, which gives sufficient view of the weld zone without going below the minimum. In oxy-fuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.

Selection chart guidelines for eye and face protection

The following chart provides general guidance for the proper selection of eye and face protection to protect against hazards associated with the listed hazard "source" operations.

Source	*Hazard*	*Protection*
IMPACT - Chipping,	Flying fragments, objects,	Spectacles with side

grinding machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding	large chips, particles, sand, dirt, etc.	protection, goggles, face shield For severe exposure, use face shield
HEAT-Furnace operation and arc welding	Hot sparks	Face shields,, spectacles with side. For severe exposure use face shield.
CHEMICALS-Acid and chemical handling, degreasing, plating	Splash	Goggles, eyecup and cover types. For severe exposure, use face shield.
DUST - Woodworking, buffing, and general buffing, and general dusty conditions.	Nuisance dust	Goggles, eye cup and cover type

Head Protection

Hats and caps have been designed and manufactured to provide workers protection from impact, heat, electrical and fire hazards. These protectors consist of the shell and the suspension combined as a protective system. Safety hats and caps will be of nonconductive, fire and water resistant materials. Bump caps or skull guards are constructed of lightweight materials and are designed to provide minimal protection against hazards when working in congested areas.

Head protection will be furnished to, and used by; all employees and contractors engaged in construction and other miscellaneous work in head-hazard areas. Head protection is required to be worn by engineers, inspectors, and visitors at construction sites. Bump caps/skull guards will be issued to and worn for protection against scalp lacerations from contact with sharp objects. They will not be worn as substitutes for safety caps/hats because they do not afford protection from high impact forces or penetration by falling objects.

<u>Selection guidelines for head protection</u>

All head protection is designed to provide protection from impact and penetration hazards caused by falling objects. Head protection is also available which provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important. Class “A“ helmets, in addition to impact and penetration resistance; provide electrical protection from low-voltage conductors (they are proof tested to 2,200 volts). Class B helmets, in addition to impact and penetration resistance; provide electrical protection from high-voltage conductors (they are proof tested to 20,000 volts). Class C helmets provide impact and penetration resistance (they are

usually made of aluminum which conducts electricity), and should not be used around electrical hazards.

Where falling object hazards are present, helmets must be worn. Some examples include: working below other workers who are using tools and materials which could fall; working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or objects to fall; and working on exposed energized conductors.

Foot Protection

General requirements
Each affected employee shall wear protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where employee's feet are exposed to electrical hazards.

Selection guidelines for foot protection
Safety shoes and boots provide both impact and compression protection. Where necessary, safety shoes can be obtained which provide puncture protection. In some work situations, metatarsal protection should be provided, and in other special situations electrical conductive or insulating safety shoes would be appropriate. Safety shoes or boots with impact protection would be required for carrying or handling materials such as packages, objects, parts or heavy tools, which could be dropped; and, for other activities where objects might fall onto the feet. Safety shoes or boots with compression protection would be required for work activities involving skid trucks (manual material handling carts) around bulk rolls (such as paper rolls) and around heavy pipes, all of which could potentially roll over an employee's feet. Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal etc., could be stepped on by employees causing a foot injury.

Hand Protection

General Requirements
Hand protection is required when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.

Skin contact is a potential source of exposure to toxic materials; it is important that the proper steps be taken to prevent such contact. Gloves should be selected on the basis of the material being handled, the particular hazard involved, and their suitability for the operation being conducted. One type of glove will not work in all situations.
Most accidents involving hands and arms can be classified under four main hazard categories: chemicals, abrasions, cutting, and heat. There are gloves available that can protect workers from any of these individual hazards or combination of hazards.

Gloves should be replaced periodically, depending on frequency of use and permeability to the substance(s) handled. Gloves overtly contaminated should be rinsed and then carefully removed after use.

Gloves should also be worn whenever it is necessary to handle rough or sharp-edged objects, and very hot or very cold materials. The types of glove materials to be used in these situations include leather, welder's gloves, aluminum-backed gloves, and other types of insulated glove materials.

Careful attention must be given to protecting your hands when working with tools and machinery. Power tools and machinery must have guards installed or incorporated into their design that prevent the hands from contacting the point of operation, power train, or other moving parts. To protect the hands from injury due to contact with moving parts, it is important to:

- Ensure that guards are always in place and used.
- Always lock out machines or tools and disconnect the power before making repairs.
- Treat a machine without a guard as inoperative; and
- Do not wear gloves around moving machinery, such as drill presses, mills, lathes, and grinders.

<u>Selection guidelines for hand protection</u>

Selection of hand PPE shall be based on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified. Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of causing local or systemic effects following dermal exposure. There is no glove that provides protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused. It is also important to know the performance characteristics of gloves relative to the specific hazard anticipated; e.g., chemical hazards, cut hazards, flame hazards, etc. Before purchasing gloves, request documentation from the manufacturer that the gloves meet the appropriate test standard(s) for the hazard(s) anticipated. Other factors to be considered for glove selection in general include:

1. As long as the performance characteristics are acceptable, in certain circumstances, it may be more cost effective to regularly change cheaper gloves than to reuse more expensive types.
2. The work activities of the employee should be studied to determine the degree of dexterity required, the duration, frequency, and degree of exposure of the hazard, and the physical stresses that will be applied.

Selection of gloves for chemical hazards

The first consideration in the selection of gloves for use against chemicals is to determine, if possible, the exact nature of the substances to be encountered. Read instructions and warnings on chemical container labels and MSDS's before working with any chemical. Recommended glove types are often listed in the section for personal protective equipment.

Chemicals eventually permeate all glove materials, however, they can be used safely for limited time periods if specific use and glove characteristics (i.e., thickness and permeation rate and time) are known. The safety office can assist is determining the specific type of glove material that should be worn for a particular chemical.

1. The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause local effects on the skin and/or to pass through the skin and cause systemic effects.
2. Generally, any "chemical resistant" glove can be used for dry powders.
3. For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials.
4. Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

HANDLING OF TRASH BAGS AND TRASH RECEPTACLES

A trash bag or trash receptacle can contain just about any type of debris, including hypodermic needles, broken glass, sharp pieces of metal or plastic, or hazardous chemicals or substances. For this reason, Triangle Services, Inc. **PROHIBITS** employees from reaching into a trash bag or trash receptacle for any reason.

Sharp objects inside of a trash bag have the potential to pierce the bag, resulting in a cut, puncture or scrape injury to employees. While handling trash bags never lift the bag from the sides or bottom. Trash bags should be tied or sealed at the top and handled by the portion of the trash bag above the tie-point. Care should be taken to prevent the trash bag from coming into contact with any portion of the body. If the situation dictates that the bags MUST be handled by the side or bottom, a hard plastic or light metal barrier must be placed between the hand and the trash bag.

HANDLING OF SHARP OR HOT OBJECTS

The handling of sharp objects (broken glass, jagged metal or plastic, tool blades, etc) or objects that are, or expected to be, warmer than 100 degrees Fahrenheit require the use of leather or heavy cotton work gloves.

WORKING NEAR MOVING EQUIPMENT

It is the policy of Triangle Services that employees do not come into contact with the moving parts of equipment or machinery. Some tasks require employees to be in close proximity to moving parts, and during the performance of these tasks employees are **PROHIBITED** to wear any type of glove. Glove use in close proximity to moving parts could result in the glove becoming entangled in the moving parts and causing the employee to be pulled into machinery.

HAND PROTECTION POLICY STATEMENT

All employees are required to read the hand protection policy and discuss it with their immediate supervisor until they understand the contents of this policy. Upon completion of the review of this policy, ALL EMPLOYEES are required to sign form SF430 Hand Protection Policy Acknowledgement. This signed form is to be kept in the personnel file of each employee.

Policy Number: SP150
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Respiratory Protection

Purpose:

In the Respiratory Protection program, hazard assessment and selection of proper respiratory protective equipment (RPE) is conducted in the same manner as for other types of personal protective equipment (PPE). In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used. References: OSHA Standards *Respiratory Protection* (29 CFR 1910.134)

Applicability:

All employees that are required to work in atmospheres that have the potential to contain hazardous gases, fumes or dusts, or atmospheres that do not contain the minimum quantity of oxygen.

Procedure:

Responsibilities

Management

- Implement the requirements of this program
- Provide a selection of respirators as required
- Enforce all provisions of this program
- Appoint a specific designated individual to conduct the respiratory protection program

Program Administrator

- Review sanitation/storage procedures.
- Ensure respirators are properly, stored, inspected and maintained
- Monitor compliance for this program
- Provide training for affected Employees
- Review compliance and ensure monthly inspection of all respirators
- Provide respirator fit testing

Designated Occupational Health care Provider

- Conduct medical aspects of program

Program Administrator
Each Facility will designate a program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

Voluntary Use of Respirators is Prohibited
OSHA requires that voluntary use of respirators, when not required by the company, must be controlled as strictly as under required circumstances. To prevent violations of the Respiratory Protection Standard employees are not allowed voluntary use of their own or company supplied respirators of any type. Exception: Employees whose only use of respirators involves the voluntary use of filtering (non-sealing) face pieces (dust masks).

Program Evaluation
Evaluations of the workplace are necessary to ensure that the written respiratory protection program is being properly implemented; this includes consulting with employees to ensure that they are using the respirators properly. Evaluations shall be conducted as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective Program evaluation will include discussions with employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
- Appropriate respirator selection for the hazards to which the employee is exposed;
- Proper respirator use under the workplace conditions the employee encounters; and

- Proper respirator maintenance.

Record Keeping
The Company will retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the Company in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

Training and Information
Effective training for employees who are required to use respirators is essential. The training must be comprehensive, understandable, and recur annually, and more often if necessary. Training will be provided prior to requiring the employee to use a respirator in the workplace. The training shall ensure that each employee can demonstrate knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- Limitations and capabilities of the respirator
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions
- How to inspect, put on and remove, use, and check the seals of the respirator
- What the procedures are for maintenance and storage of the respirator
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators
- The general requirements of this program

<u>Retraining shall be conducted annually and when:</u>

- Changes in the workplace or the type of respirator render previous training obsolete
- Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill
- Other situation arises in which retraining appears necessary to ensure safe respirator use

Training will be conducted by instructors recommended by the manufacturer or if the trainer is certified to train employees on the use of Respiratory Protection. Training is divided into the following sections:

<u>Classroom Instruction</u>

1. Overview of the Company Respiratory Protection Program & OSHA Standard
2. Respiratory Protection Safety Procedures
3. Respirator Selection
4. Respirator Operation and Use

5. Why the respirator is necessary
6. How improper fit, usage, or maintenance can compromise the protective effect.
7. Limitations and capabilities of the respirator.
8. How to use the respirator effectively in emergency situations, including respirator malfunctions
9. How to inspect, put on and remove, use, and check the seals of the respirator.
10. What the procedures are for maintenance and storage of the respirator.
11. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
12. Change out schedule and procedure for air purifying respirators.

Basic Respiratory Protection Safety Procedures

1. Only authorized and trained Employees may use Respirators. Those Employees may use only the Respirator that they have been trained on and properly fitted to use.
2. Only Physically Qualified Employees may be trained and authorized to use Respirators. A pre-authorization and annual certification by a qualified physician will be required and maintained. Any changes in an Employees health or physical characteristics will be reported to the Occupational Health Department and will be evaluated by a qualified physician.
3. Only the proper prescribed respirator or self-contained breathing apparatus (SCBA) may be used for the job or work environment. Air cleansing respirators may be worn in work environments when oxygen levels are found to be 19.5 percent to 23.5 percent, and when the appropriate air-cleansing canister, as determined by the Manufacturer and approved by the National Institute for Occupational Health (NIOSH) or the Mine Safety & Health Administration (MSHA), for the known hazardous substance is used. SCBA's will be worn in oxygen deficient and oxygen rich environments (below 19.5 percent or above 23.5 percent oxygen).
4. Employees working in environments where a sudden release of a hazardous substance is likely will wear an appropriate respirator for that hazardous substance (example: Employees working in an ammonia compressor room will have an ammonia APR respirator on their person.).
5. Only SCBA's will be used in oxygen deficient environments, environments with an unknown hazardous substance or unknown quantity of a known hazardous substance or any environment that is determined "Immediately Dangerous to Life or Health" (IDLH).
6. Employees with respirators loaned on "permanent check out" will be responsible for the sanitation, proper storage and security. Respirators damaged by normal wear will be repaired or replaced by the Company when returned.

7. The last Employee using a respirator and/or SCBA that are available for general use will be responsible for proper storage and sanitation. Monthly and after each use, all respirators will be inspected with documentation to assure its availability for use.
8. All respirators will be located in a clean, convenient and sanitary location.
9. In the event that Employees must enter a confined space, work in environments with hazardous substances that would be dangerous to life or health should an RPE fail (a SCBA is required in this environment), and/or conduct a hazardous material (HAZMAT) entry, a "buddy system" detail will be used with a Safety Watchman with constant voice, visual or signal line communication. Employees will follow the established Emergency Response Program and/or Confined Space Entry Program when applicable.
10. Management will establish and maintain surveillance of jobs and work place conditions and degree of Employee exposure or stress to maintain the proper procedures and to provide the necessary RPE.
11. Management will establish and maintain safe operation procedures for the safe use of RPE with strict enforcement and disciplinary action for failure to follow all general and specific safety rules. Standard Operation Procedures for General RPE use will be maintained as an attachment to the Respiratory Protection Program and Standard Operation Procedures for RPE use under emergency response situations will be maintained as an attachment to the Emergency Response Program.

Respirator User Policies

Adherence to the following guidelines will help ensure the proper and safe use of respiratory equipment:

- Wear only the respirator you have been instructed to use. For example, do not wear a self-containing breathing apparatus if you have been assigned and fitted for a half-mask respirator.
- Wear the correct respirator for the particular hazard. For example, some situations, such as chemical spills or other emergencies, may require a higher level of protection than your respirator can handle. Also, the proper cartridge must be matched to the hazard (a cartridge designed for dusts and mists will not provide protection for chemical vapors)
- Check the respirator for a good fit before each use. Positive and negative fit checks should be conducted.
- Check the respirator for deterioration before and after use. Do not use a defective respirator.
- Recognize indications that cartridges and canisters are at their end of service. If in doubt, change the cartridges or canisters before using the respirator.

- Practice moving and working while wearing the respirator so that you can get used to it.
- Clean the respirator after each use, thoroughly dry it and place the cleaned respirator in a sealable plastic bag.
- Store respirators carefully in a protected location away from excessive heat, light, and chemicals.

Selection of Respirators

The Company has evaluated the respiratory hazard(s) in each workplace, identified relevant workplace and user factors and has based respirator selection on these factors. Also included are estimates of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. This selection has included appropriate protective respirators for use in IDLH atmospheres, and has limited the selection and use of air-purifying respirators. All selected respirators are NIOSH certified.

Filter Classifications - These classifications are marked on the filter or filter package
N-Series: Not Oil Resistant

- Approved for non-oil particulate contaminants
- Examples: dust, fumes, mists not containing oil

R-Series: Oil Resistant

- Approved for all particulate contaminants, including those containing oil
- Examples: dusts, mists, fumes
- Time restriction of 8 hours when oils are present

P-Series: Oil Proof

- Approved for all particulate contaminants including those containing oil
- Examples: dust, fumes, mists
- See Manufacturer's time use restrictions on packaging

Respirators for IDLH atmospheres

- The following respirators will be used in IDLH atmospheres:
- A full face piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or
- A combination full-face piece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
- Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

Respirators for atmospheres that are not IDLH
The respirators selected shall be adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.
Identification of Filters & Cartridges

All filters and cartridges shall be labeled and color-coded with the NIOSH approval label and that the label is not removed and remains legible. A change out schedule for filters and canisters has been developed to ensure these elements of the respirators remain effective.

Respirator Filter & Canister Replacement

An important part of the Respiratory Protection Program includes identifying the useful life of canisters and filters used on air-purifying respirators. Each filter and canister shall be equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or If there is no ESLI appropriate for conditions a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life.

Filter & Cartridge Change Schedule
Stock of spare filers and cartridges shall be maintained to allow immediate change when required or desired by the employee

Cartridges shall be changed based on the most limiting factor below

- Prior to expiration date
- Manufacturer's recommendations for use and environment
- After each use
- When requested by employee
- When contaminate odor is detected
- When restriction to air flow has occurred as evidenced by increase effort by user to breathe normally
- Cartridges shall remain in their original sealed packages until needed for immediate use
- Filters shall be changed based on the most limiting factor below
- Prior to expiration date
- Manufactures recommendations for the specific use and environment
- When requested by employee
- When contaminate odor is detected

- When restriction to air flow has occurred as evidenced by increase effort by user to breathe normally
- When discoloring of the filter media is evident
- Filters shall remain in their original sealed package until needed for immediate use.

Respiratory Protection Schedule by Job and Working Condition
The Company maintains a Respiratory Protection Schedule by Job and Working Condition. This schedule is provided to each authorized and trained Employee. The Schedule provides the following information:

1. Job/Working Conditions
2. Work Location
3. Hazards Present
4. Type of Respirator or SCBA Required
5. Type of Filter/Canister Required
6. Location of Respirator or SCBA
7. Filter/Cartridge change out schedule

The schedule will be reviewed and updated at least annually and whenever any changes are made in the work environments, machinery, equipment, or processes or if respirator different respirator models are introduced or existing models are removed.

Permanent respirator schedule assignments are:
Each person who engages in welding will have his or her own company provided dust-mist-fume filter APR. This respirator will be worn during all welding operations.

Physical and Medical Qualifications

Records of medical evaluations must be retained and made available in accordance with 29 CFR 1910.1020.

Medical evaluation required
Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. The company provides a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace.

Medical evaluation procedures
The designated Occupational Health Care Provider will provide the employee a medical questionnaire.

Follow-up medical examination

The company shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions in Part B of the questionnaire or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the Physician deems necessary to make a final determination.

Administration of the medical questionnaire and examinations

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content. The company shall provide the employee with an opportunity to discuss the questionnaire and examination results with the Physician.

Supplemental information for the Physician

The following information must be provided to the Physician before the Physician makes a recommendation concerning an employee's ability to use a respirator

- The type and weight of the respirator to be used by the employee
- The duration and frequency of respirator use (including use for rescue and escape)
- The expected physical work effort
- Additional protective clothing and equipment to be worn
- Temperature and humidity extremes that may be encountered
- Any supplemental information provided previously to the Physician regarding an employee need not be provided for a subsequent medical evaluation if the information and the Physician remain the same

The Company has provided the Physician with a copy of the written respiratory protection program and a copy of the OSHA Standard 1910.134

Medical determination

In determining the employee's ability to use a respirator, the Company shall

- Obtain a written recommendation regarding the employee's ability to use the respirator from the Physician. The recommendation shall provide only the following information
- Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will

be used, including whether or not the employee is medically able to use the respirator

- The need, if any, for follow-up medical evaluations
- A statement that the Physician has provided the employee with a copy of the Physician's written recommendation
- If the respirator is a negative pressure respirator and the Physician finds a medical condition that may place the employee's health at increased risk if the respirator is used, the Company shall provide a APR if the Physician's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the Company is no longer required to provide a APR

Additional Medical Evaluations

At a minimum, the Company shall provide additional medical evaluations that comply with the requirements of this section if:

- An employee reports medical signs or symptoms that are related to ability to use a respirator
- A Physician, supervisor, or the respirator program administrator informs the Company that an employee needs to be reevaluated
- Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation
- A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

Respirator Fit Testing

Before an employee is required to use any respirator with a negative or positive pressure tight-fitting face piece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. The Company shall ensure that an employee using a tight-fitting face piece respirator is fit tested prior to initial use of the respirator, whenever a different respirator face piece (size, style, model or make) is used, and at least annually thereafter.

The Company has establish a record of the qualitative and quantitative fit tests administered to employees including:

- The name or identification of the employee tested
- Type of fit test performed

- Specific make, model, style, and size of respirator tested
- Date of test
- The pass/fail results for Qualitative Fit Test (QLFT) or the fit factor and strip chart recording or other recording of the test results for Quantitative Fit Test (QNFT)

Additional fit tests will be conducted whenever the employee reports, or the Company, Physician, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

If after passing a QLFT or QNFT, the employee notifies the Company, program administrator, supervisor, or Physician that the fit of the respirator is unacceptable; the employee shall be given a reasonable opportunity to select a different respirator face piece and to be retested.

Types of Fit Tests

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of OSHA Standard 1910.134.

- QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
- If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half face pieces, or equal to or greater than 500 for tight fitting full face pieces, the QNFT has been passed with that respirator.
- Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.
- Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual face piece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator face piece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator face piece.
- Quantitative fit testing of these respirators shall be accomplished by modifying the face piece to allow sampling inside the face piece in the breathing zone of the user, midway between the nose and mouth. This

requirement shall be accomplished by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the face piece.

- Any modifications to the respirator face piece for fit testing shall be completely removed, and the face piece restored to NIOSH approved configuration, before that face piece can be used in the workplace.

Fit test records shall be retained for respirator users until the next fit test is administered. Written materials required shall be made available upon request to affected employees.

Respirator Operation and Use

Respirators will only be used following the respiratory protection safety procedures established in this program. The Operations and Use Manuals for each type of respirator will be maintained by the Program Administrator and be available to all qualified users.

Surveillance by the direct supervisor shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the Company shall reevaluate the continued effectiveness of the respirator.

For continued protection of respirator users, the following general use rules apply:

- Users shall not remove respirators while in a hazardous environment
- Respirators are to be stored in sealed containers out of harmful atmospheres
- Store respirators away from heat and moisture
- Store respirators such that the sealing area does not become distorted or warped
- Store respirator such that the face piece is protected

<u>Face piece seal protection</u>
The Company does not permit respirators with tight-fitting face pieces to be worn by employees who have:

- Facial hair that comes between the sealing surface of the face piece and the face or that interferes with valve function; or
- Any condition that interferes with the face-to-face piece seal or valve function.

If an employee wears corrective glasses or goggles or other personal protective equipment, the Company shall ensure that such equipment is worn in a manner that does not interfere with the seal of the face piece to the face of the user.

Continuing Effectiveness of Respirators
The Company shall ensure the following that employees leave the respirator use area:

- To wash their faces and respirator face pieces as necessary to prevent eye or skin irritation associated with respirator use
- If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece
- To replace the respirator or the filter, cartridge, or canister elements.

If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, the Company will replace or repair the respirator before allowing the employee to return to the work area.

Procedures for IDLH atmospheres
For all IDLH atmospheres, the Company shall ensure that:

- One employee or, when needed, more than one employee is located outside the IDLH atmosphere
- Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere
- The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue
- The Company or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue
- The Company or designee authorized to do so by the Company, once notified, provides necessary assistance appropriate to the situation

Employee(s) located outside the IDLH atmospheres will be equipped with:

- Pressure demand or other positive pressure SCBA's, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
- Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
- Equivalent means for rescue where retrieval equipment is not required.

Cleaning and Disinfecting

The Company shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The Company shall ensure that respirators are cleaned and disinfected using the Standard Operating Procedure SOP: Cleaning and Disinfecting.
The respirators shall be cleaned and disinfected when:

- Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition
- Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals
- Respirators maintained for emergency use shall be cleaned and disinfected after each use
- Respirators used in fit testing and training shall be cleaned and disinfected after each use.

Cleaning and Storage of respirators assigned to specific employees is the responsibility of that Employee.

Respirator Inspection

All respirators/SCBA's, both available for "General Use" and those on "Permanent Check-out", will be inspected after each use and at least monthly. Should any defects be noted, the respirator/SCBA will be taken to the program Administrator. Damaged Respirators will be either repaired or replaced. The inspection of respirators loaned on "Permanent Check-out" is the responsibility of that trained Employee.

Respirators shall be inspected as follows:

- All respirators used in routine situations shall be inspected before each use and during cleaning
- All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use
- Emergency escape-only respirators shall be inspected before being carried into the workplace for use

Respirator inspections include the following:

- A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the face piece, head straps, valves, connecting tube, and cartridges, canisters or filters
- Check of elastomeric parts for pliability and signs of deterioration.

- Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The Company shall determine that the regulator and warning devices function properly

For Emergency Use Respirators the additional requirements apply:

- Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator.

- Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

Respirator Storage
Respirators are to be stored as follows:

- All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the face piece and exhalation valve.

- Emergency Respirators shall be:

- Kept accessible to the work area;

- Stored in compartments or in covers that are clearly marked as containing emergency respirators; and

- Stored in accordance with any applicable manufacturer instructions.

Repair of Respirators
Respirators that fail an inspection or are otherwise found to be defective will be removed from service and discarded, repaired or adjusted in accordance with the following procedures:

- Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;

- Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and

- Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

Breathing Air Quality and Use

The Company shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

- Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and
- Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
    1. Oxygen content (v/v) of 19.5-23.5%;
    2. Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
    3. Carbon monoxide (CO) content of 10 ppm or less;
    4. Carbon dioxide content of 1,000 ppm or less; and
    5. Lack of noticeable odor.
- Compressed oxygen will not be used in atmosphere-supplying respirators that have previously used compressed air
- Oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution
- Cylinders used to supply breathing air to respirators meet the following requirements
- Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178)
- Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air
- Moisture content in breathing air cylinders does not exceed a dew point of -50 deg. F (-45.6 deg. C) at 1 atmosphere pressure

- Breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing airlines.

- Breathing gas containers shall be marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.

DEFINITIONS/ACRONYMS

The following terms are most common when speaking the language of respiratory protection:

ACGIH - American Conference of Government Industrial Hygienists. A group which sets forth appropriate standards with regard to safety practice.

Approved Respirator - An approved respirator has been reviewed by the Branch Safety Officer and approved/tested for use by a recognized professional industrial hygiene agency such as NIOSH of MSA. Respirators must be carefully selected for each specific type of application and use (i.e. acid mist, organic vapors, etc.)

mg/m3 - milligrams per cubic meter

MSA - Mine Safety Administration. A group who sets forth standards with regard to respiratory protection. This agency was developed with the evidence of threat to the health of mine workers. Many respirator manufacturer's seek the M.S.A.'s approval for their products.

NIOSH - National Institute of Occupational Safety and Health. Works in conjunction with O.S.H.A. in devising and implementing safety rules and regulations.

OSHA - Occupational Safety & Health Administration. The governing federal agency that devises and enforces employer safety rules and regulations. In 1970, it was determined by O.S.H.A. that employers provide safe working conditions for their employees.

Respirator - Any device used for the purpose of protecting the wearer from inhalation of harmful atmospheres. Even dust masks are considered to be respirators.

TLV - Threshold Limit Value. Refers to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed to day after day without adverse effect. "TLV's" are based on the best available information from industrial experience, from experimental human and animal studies, and, whenever possible, from a combination of the three. These limits are intended for the use in the practice of industrial hygiene as guidelines or recommendations in the control of potential hazards and for no other use. The TLV for total dust is 10mg/m3. The TLV for respirable dust is 5mg/m3.

Policy Number: SP160
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Fire Safety

Purpose:

The Company's Fire Safety Plan has been developed to work in conjunction with the client's emergency plans and other safety programs. This includes reviewing all new building construction and renovations to ensure compliance with applicable state, local, and national fire and life safety standards. Fire prevention measures reduce the incidence of fires by eliminating opportunities for ignition of flammable materials.

Applicability:

All employees

Procedure:

Responsibilities

Management

- Ensure all fire prevention methods are established and enforced
- Ensure fire suppression systems such as sprinklers and extinguishers are periodically inspected and maintained to a high degree of working order
- Train supervisors to use fire extinguishers for incipient fires
- Train employees on evacuation routes and procedures

Supervisors

- Closely monitor the use of flammable materials and liquids
- Train assigned employees in the safe storage, use and handling of flammable materials
- Ensure flammable material storage areas are properly maintained

Employees

- Use, store and transfer flammable materials in accordance with provided training
- Do not mix flammable materials
- Immediately report violations of the Fire Safety Program

Hazards

Fire and explosion hazards can exist in almost any work area. Potential hazards include:

- Improper operation or maintenance of gas fired equipment
- Improper storage or use of flammable liquids
- Smoking in prohibited areas
- Accumulation of trash
- Unauthorized Hot Work operations

Hazard Control

<u>Elimination of Ignition Sources</u>

All nonessential ignition sources must be eliminated where flammable liquids are used or stored. The following is a list of some of the more common potential ignition sources:

- Open flames, such as cutting and welding torches, furnaces, matches, and heaters-these sources should be kept away from flammable liquids operations. Cutting or welding on flammable liquid equipment should not be performed unless the equipment has been properly emptied and purged with a neutral gas such as nitrogen.
- Chemical sources of ignition such as DC. Motors, switched, and circuit breakers-these sources should be eliminated where flammable liquids are handled or stored. Only approved explosion-proof devices should be used in these areas.
- Mechanical sparks-these sparks can be produced as a result of friction. Only nonsparking tools should be used in areas where flammable liquids are stored or handled.
- Static sparks-these sparks can be generated as a result of electron transfer between two contacting surfaces. The electrons can discharge in a small volume, raising the temperature to above the ignition temperature. Every effort should be made to eliminate the possibility of static sparks. Also proper bonding and grounding procedures must be followed when flammable liquids are transferred or transported.

Removal of Incompatibles

Materials that can contribute to a flammable liquid fire should not be stored with flammable liquids. Examples are oxidizers and organic peroxides, which, on decomposition, can generate large amounts of oxygen.

Control of Flammable Gases

Generally, flammable gases pose the same type of fire hazards as flammable liquids and their vapors. Many of the safeguards for flammable liquids also apply to flammable gases, other properties such as toxicity, reactivity, and corrosiveness also must be taken into account. Also, a gas that is flammable could produce toxic combustion products.

Fire Extinguishers

A portable fire extinguisher is a "first aid" device and is very effective when used while the fire is small. The use of fire extinguisher that matches the class of fire, by a person who is well trained, can save both lives and property. Portable fire extinguishers must be installed in workplaces regardless of other firefighting measures. The successful performance of a fire extinguisher in a fire situation largely depends on its proper selection, inspection, maintenance, and distribution.

Classification of Fires and Selection of Extinguishers

Fires are classified into four general categories depending on the type of material or fuel involved. The type of fire determines the type of extinguisher that should be used to extinguish it.

1. Class A fires involve materials such as wood, paper, and cloth which produce glowing embers or char.

2. Class B fires involve flammable gases, liquids, and greases, including gasoline and most hydrocarbon liquids which must be vaporized for combustion to occur.

3. Class C fires involve fires in live electrical equipment or in materials near electrically powered equipment.

4. Class D fires involve combustible metals, such as magnesium, zirconium, potassium, and sodium.

Extinguishers will be selected according to the potential fire hazard, the construction and occupancy of facilities, hazard to be protected, and other factors pertinent to the situation.
Location and Marking of Extinguishers

Extinguishers will be conspicuously located and readily accessible for immediate use in the event of fire. They will be located along normal paths of travel and egress. Wall

recesses and/or flush-mounted cabinets will be used as extinguisher locations whenever possible.

Extinguishers will be clearly visible. In locations where visual obstruction cannot be completely avoided, directional arrows will be provided to indicate the location of extinguishers and the arrows will be marked with the extinguisher classification.

If extinguishers intended for different classes of fire are located together, they will be conspicuously marked to ensure that the proper class extinguisher selection is made at the time of a fire. Extinguisher classification markings will be located on the front of the shell above or below the extinguisher nameplate. Markings will be of a size and form to be legible from a distance of 3 feet.

Portable extinguishers will be maintained in a fully charged and operable condition. They will be kept in their designated locations at all times when not being used. When extinguishers are removed for maintenance or testing, a fully charged and operable replacement unit will be provided.

Extinguishers will be installed on hangers, brackets, in cabinets, or on shelves. Extinguishers having a gross weight not exceeding 40 pounds will be so installed that the top of the extinguisher is not more than 3-1/2 feet above the floor.

Extinguishers mounted in cabinets or wall recesses or set on shelves will be placed so that the extinguisher operating instructions face outward. The location of such extinguishers will be made conspicuous by marking the cabinet or wall recess in a contrasting color that will distinguish it from the normal decor.

Extinguishers must be distributed in such a way that the amount of time needed to travel to their location and back to the fire does not allow the fire to get out of control. OSHA requires that the travel distance for Class A and Class D extinguishers not exceed 75 feet. The maximum travel distance for Class B extinguishers is 50 feet because flammable liquid fires can get out of control faster that Class A fires. There is no maximum travel distance specified for Class C extinguishers, but they must be distributed on the basis of appropriate patterns for Class A and B hazards.

Once an extinguisher is selected, purchased, and installed, it is the responsibility of hired inspection agency to provide inspection of each fire extinguisher in our client's facility. (All local fire department regulations should be followed). The Company will oversee the inspection, maintenance, and testing of fire extinguishers to ensure that they are in proper working condition and have not been tampered with or physically damaged. This policy will work in conjunction with client policy and practices.

Fire Safety Inspections & Housekeeping

First line supervisors and Safety Committees are responsible for conducting work site surveys that include observations of compliance with the Fire Safety Program. These surveys should include observations of worksite safety and housekeeping issues and should specifically address proper storage of chemicals and supplies, unobstructed access

to fire extinguishers, and emergency evacuation routes. Also, they should determine if an emergency evacuation plan is present in work areas and that personnel are familiar with the plan.

Emergency Exits

Every exit will be clearly visible, or the route to it conspicuously identified in such a manner that every occupant of the building will readily know the direction of escape from any point. At no time will exits be blocked.

Any doorway or passageway which is not an exit or access to an exit but which may be mistaken for an exit, will be identified by a sign reading "Not An Exit" or a sign indicating it's actual use (i.e., "Storeroom"). A readily visible sign will mark all exits and accesses to exits. Each exit sign (other than internally illuminated signs) will be illuminated by a reliable light source providing not less than 5 foot-candles on the illuminated surface.

Emergency Plan for Persons with Disabilities

If any office personnel need help during an evacuation, please follow the following guide.

The responsibility to assist Persons with Disabilities (PWD) will only be followed if requested to assist during an evacuation. Place these specific rules in your Site Operation Manual. Supervisors, alternates, and the person with a disability will be trained on available escape routes and methods.

- A list of persons with disabilities is kept in the maintenance or Client's safety office.
- Visitors who have disabilities will be assisted in a manner similar to that of company employees. The Host of the person with disabilities will assist in their evacuation.

Emergencies Involving Fire

<u>Evacuation Routes and Plans</u>

Each facility shall have an emergency evacuation plan. All emergency exits shall conform to NFPA standards.

Should evacuation be necessary, go to the nearest exit or stairway and proceed to an area of refuge outside the building. Most stairways are fire resistant and present barriers to smoke if the doors are kept closed.

Do not use elevators. Should the fire involve the control panel of the elevator or the electrical system of the building, power in the building may be cut and you could be trapped between floors. Also, the elevator shaft can become a flue, lending itself to the passage and accumulation of hot gases and smoke generated by the fire.

Emergency Coordinators/Supervisors

Emergency Coordinators/Supervisors will be responsible for verifying personnel have evacuated from their assigned areas.

Fire Emergency Procedures

If you discover a fire

1. Activate the nearest fire alarm.
2. Notify your Supervisor and other occupants.

Fight the fire ONLY if

1. You have been instructed to perform this function and have received formal training, AND
2. The fire department has been notified of the fire, AND
3. The fire is small and confined to its area of origin, AND
4. You have a way out and can fight the fire with your back to the exit, AND
5. You have the proper extinguisher, in good working order, AND know how to use it.
6. If you're not sure of your ability or the fire extinguisher's capacity to contain the fire, leave the area.

If you hear a fire alarm

1. Evacuate the area. Close windows, turn off gas jets, and close doors as you leave.
2. Leave the building and move away from exits and out of the way of emergency operations.
3. Assemble in a designated area.
4. Report to the monitor so he/she can determine that all personnel have evacuated your area.
5. Remain outside until competent authority states that it is safe to re-enter.

Evacuation Routes

1. Learn at least two escape routes, and emergency exits from your area.
2. Never use an elevator as part of your escape route.
3. Learn to activate a fire alarm.
4. Learn to recognize alarm sounds.
5. Take an active part in fire evacuation drills.

Policy Number: SP170
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Prevention of Slips, Trips and Falls

Purpose:

Slips, trips, and falls constitute the majority of general industry accidents. They cause 15% of all accidental deaths, and are second only to motor vehicles as a cause of fatalities. Active participation by management, supervisors and employees is necessary to prevent hazardous conditions that could result in slips, trips or falls.

Applicability:

All employees

Procedure:

Responsibilities

Management

- Conduct routine inspections to ensure all walking and working surfaces are free from slip, trip and fall hazards.
- Conduct training for employees who use ladders, scaffolds or other elevated platforms
- Conduct training in use and inspection of fall prevention & arrest equipment
- Ensure proper ladders are used for specific tasks
- Provide adequate fall prevention & arrest equipment

Employees

- Maintain work areas free from slip, trip & fall hazards
- Correct or immediately report slip, trip and fall hazards
- Use proper ladders for assigned tasks

Hazard Control

Engineering Controls

- Proper construction of elevated locations
- Use of hand, knee and toe rails where required
- Proper design of fixed ladders & stairs
- Adequate lighting in all areas

Administrative Controls

- Training for all employees who work at elevated location
- Routine inspections of ladders, stairs, walking and working surfaces
- Following Housekeeping Program requirements
- Immediate cleanup of material spills

General Requirements

Housekeeping

Simple housekeeping methods can prevent slip-trip-fall hazards:

- All work areas, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition.
- The floor of every area shall be maintained in a clean and dry condition. Where wet processes are used, drainage shall be maintained and gratings, mats, or raised platforms shall be provided.
- Every floor, work area and passageway shall be kept free from protruding nails, splinters, holes, or loose boards.

Aisles and Passageways

- Aisles and passageways shall be kept clear and in good repair with no obstruction across or in aisles that could create a hazard.
- Permanent aisles and passageways shall be appropriately marked.
- Where mechanical handling equipment is used, aisles shall be sufficiently wide. Improper aisle widths coupled with poor housekeeping and vehicle traffic can cause injury to employees, damage the equipment and material, and can limit egress in emergencies.

Floor Loading Protection (Use This Section As A Guide, If Applicable)

Load rating limits shall be marked on plates and conspicuously posted. It shall be unlawful to place, or cause, or permit to be placed, on any floor or roof of a building or other structure, a load greater than that for which such floor or roof is approved.

Guarding Floor & Wall Openings

Floor openings and holes, wall openings and holes, and the open sides of platforms may create hazards. People may fall through the openings or over the sides to the level below. Objects, such as tools or parts, may fall through the holes and strike people or damage machinery on lower levels.

Protection for Floor Openings

Standard railings shall be provided on all exposed sides of a stairway opening, except at the stairway entrance. For infrequently used stairways, where traffic across the opening prevents the use of a fixed standard railing, the guard shall consist of a hinged floor opening cover of standard strength and construction along with removable standard railings on all exposed sides, except at the stairway entrance.

A "standard railing" consists of top rail, mid rail, and posts, and shall have a vertical height of 42 inches nominal from the upper surface of top rail to floor, platform, runway, or ramp level. Nominal height of mid rail is 21 inches.

A "standard toe board" is 4 inches nominal in vertical height, with not more than ¼-inch clearance above floor level.

Floor openings may be covered rather than guarded with rails. When the floor opening cover is removed, a temporary guardrail shall be in place, or an attendant shall be stationed at the opening to warn personnel.

Every floor hole where persons can accidentally walk, shall be guarded by either:

- A standard railing with toe board, or
- A floor hole cover of standard strength and construction.

While the cover is not in place, the floor hole shall be constantly attended by someone or shall be protected by a removable standard railing.

Protection of Open-Sided Floors, Platforms, and Runways

Every open-sided floor or platform 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing on all open sides, except where there is an entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a toe board wherever, beneath the open sides:

- Persons can pass,

- There is moving machinery, or
- There is equipment with which falling materials could create a hazard.

A standard railing, or the equivalent, on all sides 4 feet or more above floor or ground level, shall guard every runway. Wherever tools, machine parts, or materials are likely to be used on the runway, a toe board shall also be provided on each exposed side.

Stairway Railings and Guards

Every flight of stairs with four or more risers shall have standard stair railings or standard handrails as specified below. Stair width is measured clear of all obstructions except handrails.

- On stairways less than 44 inches wide having both sides enclosed, at least one handrail shall be affixed, preferably on the right side descending.
- On stairways less than 44 inches wide with one open side, at least one stair rail shall be affixed on the open side.
- On stairways less than 44 inches wide having both sides open, two stair rails shall be provided, one for each side.
- On stairways more than 44 inches wide, but less than 88 inches, one handrail shall be provided on each enclosed side and one stair rail on each open side.
- On stairways 88 inches or more in width, one handrail shall be provided on each enclosed side, one stair rail on each open side, and one intermediate stair rail placed approximately in the middle of the stairs.

A "standard stair railing" (stair rail) shall be of construction similar to a standard railing, but the vertical height shall be not more than 34 inches nor less than 30 inches from the upper surface of the top rail to the surface of the tread in line with the face of the riser at the forward edge of the tread.

Fixed Industrial Stairs

Fixed Industrial Stairs shall be provided for access to and from places of work where operations necessitate regular travel between levels. Requirements include:

- Fixed industrial stairs shall be strong enough to carry five times the normal anticipated live load.
- At the very minimum, any fixed stairway shall be able to carry safely a moving concentrated load of 1000 pounds.
- All fixed stairways shall have a minimum width of 22 inches.
- Fixed stairs shall be installed at angles to the horizontal of between 30^{o} and 50^{o}.
- Vertical clearance above any stair tread to an overhead obstruction shall be at least 7 feet measured from the leading edge of the tread.

Portable Ladders

The chief hazard when using a ladder is falling. A poorly designed, maintained, or improperly used ladder may collapse under the load placed upon it and cause the employee to fall.

A ladder is an appliance consisting of two side rails joined at regular intervals by crosspieces on which a person may step to ascend or descend.
The various types of portable ladders include:

- Stepladder - A self-supporting portable ladder, non-adjustable in length, having flat steps and hinged back.
- Single Ladder - A non self-supporting portable ladder, nonadjustable in length, consisting of but one section. Its size is designed by overall length of the side rail.
- Extension Ladder - A non self-supporting portable ladder adjustable in length.

Portable Ladder Requirements:

- Portable stepladders longer than 20 feet shall not be used.
- Stepladders shall be equipped with a metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in open position.
- Single ladders longer than 30 feet shall not be used.
- Extension ladders longer than 60 feet shall not be used.
- Ladders shall be maintained in good condition at all times.
- Ladders shall be inspected frequently and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "Dangerous, Do Not Use."

Proper use of ladders is essential in preventing accidents. Even a good ladder can be a serious safety hazard when used by workers in a dangerous way.
Portable Ladder Safety Precautions:

- Ladders shall be placed with a secure footing, or they shall be lashed, or held in position.
- Ladders used to gain access to a roof or other area shall extend at least 3 feet above the point of support.
- The foot of a ladder shall, where possible, be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder
- The worker shall always *face* the ladder when climbing up or down.
- Short ladders shall not be spliced together to make long ladders.

- Ladders shall never be used in the horizontal position as scaffolds or work platforms.
- The top of a regular stepladder shall not be used as a step.
- Use both hands when climbing or descending ladders.
- Metal ladders shall never be used near electrical equipment.

Fixed Ladders

A fixed ladder is a ladder permanently attached to a structure, building or equipment. A point to remember is that fixed ladders, with a length of more than 20 feet to a maximum unbroken length of 30 feet shall be equipped with cages or a ladder safety device. A "cage" is a guard that is fastened to the side rails of the fixed ladder or to the structure to encircle the climbing space of the ladder for the safety of the person who must climb the ladder.

Cages shall extend a minimum of 42 inches above the top of a landing, unless other acceptable protection is provided.

Cages shall extend down the ladder to a point not less than 7 feet or more than 8 feet above the base of the ladder.

Scaffolding Safety

- The footing or anchorage for scaffolds shall be sound, rigid and capable of carrying the maximum intended load without settling or displacement. Unstable objects, such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.
- Scaffolds and their components shall be capable of supporting at least *four times* the maximum intended load.
- Scaffolds shall be maintained in a safe condition and shall not be altered or moved horizontally while they are in use or occupied.
- Damaged or weakened scaffolds shall be immediately repaired and shall not be used until repairs have been completed.
- A safe means must be provided to gain access to the working platform level through the use of a ladder, ramp, etc.
- Overhead protection must be provided for personnel on a scaffold exposed to overhead hazards.
- Guardrails, midrails, and toe boards must be installed on all open sides and ends of platforms more than 10 feet above the ground or floor. Wire mesh must be installed between the toe board and the guardrail along the entire opening, where persons are required to work or pass under the scaffolds.

- Employees shall not work on scaffolds during storms or high winds or when covered with ice or snow.
- As noted earlier, there are a number of scaffold types, 29 CFR 1910.28 should be reviewed carefully for special requirements that apply to each type.

Manually Propelled Mobile Ladder Stands And Scaffolds (Towers)

- All exposed surfaces of mobile ladder stands and scaffolds shall be free from sharp edges, burrs, or other safety hazards.
- The maximum work height shall not exceed four times the minimum base dimension unless outriggers, guys or braces are added to provide stability.
- This standard requires guardrails and toe boards for work levels 10 feet or more above the ground or floor.

Other Working Surfaces

Portable dock boards (bridge plates) shall be secured in position, either by being anchored or equipped with devices that will prevent their slipping out of position. Movement of the dock board during material handling operations has resulted in forklifts overturning, or falling off the dock, often with serious injury or death to the driver and damage to equipment and material.

- Handholds shall be provided on portable dock boards to permit safe handling when the dock board must be repositioned or relocated.
- Portable dock boards shall be inspected prior to use
- When not in use, portable dock boards will be stored in a manner to prevent damage

Policy Number: SP175
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Ladder and Scaffolding Safety

Purpose:

Ladders present unique opportunities for unsafe acts and unsafe conditions. Employees who use ladders must be trained in proper selection, inspection, use, and storage. OSHA reference: (29 CFR 1910.25, 1910.26, and 1910.27).

Applicability:

All employees that are required to use ladders or scaffolding during the performance of work tasks.

Procedure:

Ladders

Hazards include:

- Ladders with missing or broken parts.
- Using a ladder with too low a weight rating
- Using a ladder that is too short for purpose.
- Using metal ladders near electrical wires.
- Using ladders as a working platform
- Objects falling from ladders

Ladder Inspection

Inspect ladders before each use.

- All rungs and steps are free of oil, grease, dirt, etc.
- All fittings are tight.
- Spreaders or other locking devices are in place.
- Non-skid safety feet are in place.

- No structural defects, all support braces intact.
- Do not use broken ladders. Most ladders cannot be repaired to manufacturer specifications. Throw away all broken ladders.

Ladder Storage

Store ladders on sturdy hooks in areas where they cannot be damaged. Store to prevent warping or sagging. Do not hang anything on ladders that are in a stored condition. Ladders that can't be stored on a hook should be stored on the floor in a horizontal position, with no other items stored on top of them. If space limitations prevent a ladder from being stored horizontally, the ladders can be stored vertically against a wall, but must have a device in place that prevents the ladder from falling, such as a bungee cord or rope.

Ladder load ratings

- I-A 300 pounds (heavy duty)
- I 250 pounds (heavy duty)
- II 225 pounds (medium duty)
- III 200 pounds (light duty).

When evaluating a ladder's load rating keep in mind that the total load on the ladder will include the body weight of the user along with all clothing, tools equipment and material that will be used while on the ladder.

Limits on ladder length:

- A stepladder should be no more than 20 feet high.
- A one-section ladder should be no more than 30 feet.
- An extension ladder can go to 60 feet, but the sections must overlap.

Ladder Setup

The following procedure must be followed to prevent ladder accidents:

- Place ladder on a clean slip free level surface.
- Extend the ladder to have about 4 feet above the top support or work area.
- Anchor the top and bottom of the ladder
- Place the ladder base 1/4 the height, of the ladder, from the wall when using an extension ladder.
- Never allow more than one person on a ladder
- Use carriers and tool belts to carry objects up a ladder
- Do not lean out from the ladder in any direction
- If you have a fear of heights - don't climb a ladder

- Do not allow others to work under a ladder in use.

Ladder Maintenance

- Keep ladders clean
- Never replace broken parts unless provided by the original manufacturer
- Do not attempt to repair broken side rails
- Keep all threaded fasteners properly adjusted
- Replace worn steps with parts from manufacturer

All ladders used by Triangle Services and its affiliated company's employees must be in good condition, made of suitable material, proper length, and of the correct type for the intended use. To ensure this, each site supervisor will be required to complete a ladder assessment at least annually. Many ladders that are used by our employees are not owned by Triangle Services and its affiliated companies. Therefore, it is the responsibility of the supervisor to initiate inspection efforts and communicate any deficiencies to the customer. The following guidelines apply to ladder use:

- Damaged ladders must never be used: they should be repaired or destroyed.
- Ladders used near electrical equipment must be made of a nonconducting material.
- Stored ladders must be easily accessible for inspection and service. They must also be kept out of weather conditions, away from excessive heat, and well supported when stored horizontally.
- A portable ladder must not be used in a horizontal position as a platform or runway or by more than one person at a time.
- A portable ladder must not be placed in front of doors that open toward the ladder or on boxes, barrels, or other unstable bases.
- Ladders must not be used as guys, braces, or skids.
- The height of a step ladder should be sufficient to reach the work station without using the top or next to the top steps.
- Bracing on the back legs of stepladders must not be used for climbing.
- The proper angle for a portable straight ladder (75-1/2 degrees) can be obtained by placing the base of the ladder a distance from the vertical wall equal to one quarter of the vertical distance from base to top of the ladder's resting point.
- Ladders must be ascended or descended facing the ladder with both hands free to grasp.
- Tools must be carried in a tool belt or raised with a hand line attached to the top of the ladder.
- Extension ladders should be tied in place to prevent side slip.
- As per OSHA standard, any stationary ladder that is 10 feet or higher will be caged.

Scaffolds

All scaffolds whether fabricated on site, purchased, or rented must conform with the specifications found in ANSI A10.8, Safety Requirements for Scaffolding. Rolling scaffolds must maintain a 3:1 height to base ration (use smaller dimension of base).

- The footing or anchorage for a scaffold must be sound, rigid, and capable of carrying the maximum intended load without settling or displacement.
- Unstable objects such as barrels, boxes, loose brick, or concrete blocks must not be used to support scaffolds or planks.
- No scaffold may be erected, moved, dismantled, or altered unless supervised by competent persons.
- Scaffolds and their components must be capable of supporting at least four times the maximum intended load without failure.
- Guard rails and toe boards must be installed on open sides and ends of scaffolds and platforms more than 10 ft. above the ground or floor.
- Scaffolds 4 feet to 10 feet in height that have a minimum horizontal dimension in either direction of less than 45 inches must have standard installed on all open sides and ends of the platform.
- Wire, synthetic, or fiber rope used for suspended scaffolds must be capable of supporting at least 6 times the rated load.
- No riveting, welding, burning or open flame work may be performed on any staging suspended by means of fiber or synthetic rope.
- Treated fiber or approved synthetic ropes must be used for or near any work involving the use of corrosive substances.
- All scaffolds, bosons chairs, and other work access platforms must conform with the requirements set forth in the Federal Occupational Safety and Health Regulations for Construction, 29.CFR 1926.451, except where the specifications in ANSI A10.8 are more rigorous.

As part of the effort to achieve ladder and scaffold safety, surrounding conditions should be safe as well. The following areas should always be considered:

- Workroom floors must be in clean and dry condition.
- Drainage mates, platforms, or false floors should be used where wet processes are performed.
- Floors must be free from protruding nails, splinters, holes, and loose boards or tiles.

- Permanent aisles or passageways must be marked.
- Floor holes must be protected by covers that leave no openings more than one inch wide.
- Floor openings into which persons can accidentally walk must be guarded by standard railings and toe boards.
- Open-sided floors, platforms, and runways higher than four feet must be guarded by standard railings.
- Toe boards must be used wherever people can pass below or hazardous equipment or materials are below.

Policy Number: SP180
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Fall Protection

Purpose:

The purpose of the fall protection program is to:

- Ensure all work areas are free from uncontrolled fall hazards
- Ensure all employees are properly trained in fall prevention and protection
- Ensure fall prevention systems are inspected and monitored to ensure effectiveness

Applicability:

All employees required to work in elevated areas, or near unguarded edges that could result in a fall of 6 feet or more.

Procedure:

It is the policy of the Company to take all practical measures possible to prevent employees from being injured by falls. We will take necessary steps to eliminate, prevent, and control fall hazards. We will comply fully with the OSHA Fall Protection standard (CFR 1926, Subpart M, Fall Protection). The first priority is given to the elimination of fall hazards. If a fall hazard cannot be eliminated, effective fall protection will be planned, implemented, and monitored to control the risks of injury due to falling.

All employees exposed to potential falls from heights will be trained to minimize the exposures. Fall protection equipment will be provided and its use required by all employees. Managers, Foreman, or lead mechanics will be responsible for implementation of a fall protection plan for their jobsite.

Hazard Identification

The Managers, Foreman, or lead mechanics on each jobsite will be responsible for identifying fall hazards on their jobsite. The Managers, Foreman, or lead mechanics will

evaluate each situation or work procedure where employees may be exposed to a fall of 6 feet or more. The Managers, Foreman, or lead mechanics will be responsible for developing a plan to eliminate the exposures, if possible, or to select the appropriate fall protection systems and/or equipment.

Hazard Control

Engineering Controls

- Personal Fall Protection
- Guard Rail Systems
- Positioning Devices
- Warning Line Systems
- Floor Opening Covers

Administrative Controls

- Controlled access zones
- Employee training
- Audits
- Inspections
- Supervision
- Signs

Fall Protection Required

The following are examples of situations were fall protection would be needed. This listing is by no means complete, and there are many other situations where a fall of 6 feet or more is possible. It should be noted that ladders and scaffolding are not included in this list because they are covered by other OSHA standards and other requirements of our safety program.

Wall Openings: Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet (1.8 meters) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0 meter) above the walking/working surface must be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.

Holes: Personal fall arrest systems, covers, or guardrail systems shall be erected around holes (including skylights) that are more than 6 feet (1.8 meters) above lower levels.

Leading Edges: Each employee who is constructing a leading edge 6 feet (1.8 meters) or

more above lower levels shall be protected by guardrail systems, safety net systems, or personal fall arrest systems.

Excavations: Each employee at the edge of an excavation 6 feet (1.8 meters) or more deep shall be protected from falling by guardrail systems, fences, barricades, or covers. Where walkways are provided to permit employees to cross over excavations, guardrails are required on the walkway if it is 6 feet (1.8 meters) or more above the excavation.

Formwork and Reinforcing Steel: For employees, while moving vertically and/or horizontally on the vertical face of rebar assemblies built in place, fall protection is not required when employees are moving. OSHA considers the multiple hand holds and foot holds on rebar assemblies as providing similar protection as that provided by a fixed ladder. Consequently, no fall protection is necessary while moving point to point for heights below 24 feet (7.3 meters). An employee must be provided with fall protection when climbing or otherwise moving at a height more than 24 feet (7.3 meters), the same as for fixed ladders.

Hoist Areas: Each employee in a hoist area shall be protected from falling 6 feet (1.8 meters) or more by guardrail systems or personal fall arrest systems. If guardrail systems (or chain gate or guardrail) or portions thereof must be removed to facilitate hoisting operations, as during the landing of materials, and a worker must lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee must be protected by a personal fall arrest system.

Ramps, Runways, and Other Walkways: Each employee using ramps, runways, and other walkways shall be protected from falling 6 feet (1.8 meters) or more by guardrail systems.

Low-slope Roofs: Each employee engaged in roofing activities on low-slope roofs with unprotected sides and edges 6 feet (1.8 meters) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest systems or a combination of a warning line system and guardrail system, warning line system and safety net system, warning line system and personal fall arrest system, or warning line system and safety monitoring system. On roofs 50 feet (15.24 meters) or less in width, the use of a safety monitoring system without a warning line system is permitted.

Steep Roofs: Each employee on a steep roof with unprotected sides and edges 6 feet (1.8 meters) or more above lower levels shall be protected by guardrail systems with toe boards, safety net systems, or personal fall arrest systems.

Fall Protection Systems

When there is a potential fall of 6 feet or more, we will utilize one or more of the following means of providing protection:

Guardrail Systems

Guardrail systems must meet the following criteria. Top rails and mid-rails of guardrail systems must be at least one-quarter inch (0.6 centimeters) nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, it must be flagged at not more than 6 feet intervals (1.8 meters) with high-visibility material. Steel and plastic banding cannot be used as top rails or mid-rails. Manila, plastic, or synthetic rope used for top rails or mid-rails must be inspected as frequently as necessary to ensure strength and stability.

The top edge height of top rails, or (equivalent) guardrails must be 42 inches (1.1 meters) plus or minus 3 inches (8 centimeters), above the walking/working level. When workers are using stilts, the top edge height of the top rail, or equivalent member, must be increased an amount equal to the height of the stilts.

Screens, mid-rails, mesh, intermediate vertical members, or equivalent intermediate structural members must be installed between the top edge of the guardrail system and the walking/working surface when there are no walls or parapet walls at least 21 inches (53 centimeters) high. When mid-rails are used, they must be installed to a height midway between the top edge of the guardrail system and the walking/working level.

When screens and mesh are used, they must extend from the top rail to the walking/working level and along the entire opening between top rail supports. Intermediate members, such as balusters, when used between posts, shall not be more than 19 inches (48 centimeters) apart.
Other structural members, such as additional mid-rails and architectural panels, shall be installed so that there are no openings in the guardrail system more than 19 inches (48 centimeters).

The guardrail system must be capable of withstanding a force of at least 200 pounds (890 newtons) applied within 2 inches of the top edge in any outward or downward direction. When the 200 pound (890 Newton's) test is applied in a downward direction; the top edge of the guardrail must not deflect to a height less than 39 inches (1 meter) above the walking/working level.

Mid-rails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding a force of at least 150 pounds (667 newtons) applied in any downward or outward direction at any point along the mid-rail or other member.

Guardrail systems shall be surfaced to protect workers from punctures or lacerations and to prevent clothing from snagging.
The ends of top rails and mid-rails must not overhang terminal posts, except where such overhang does not constitute a projection hazard.

When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section must be placed across the access opening between guardrail sections when hoisting operations are not taking place.

At holes, guardrail systems must be set up on all unprotected sides or edges. When holes are used for the passage of materials, the hole shall have not more than two sides with removable guardrail sections. When the hole is not in use, it must be covered or provided with guardrails along all unprotected sides or edges.

If guardrail systems are used around holes that are used as access points (such as ladder ways), gates must be used or the point of access must be offset to prevent accidental walking into the hole.

If guardrails are used at unprotected sides or edges of ramps and runways, they must be erected on each unprotected side or edge.

Personal Fall Arrest Systems

These consist of an anchorage, connectors, and a body belt or body harness and may include a deceleration device, lifeline, or suitable combinations. If a personal fall arrest system is used for fall protection, it must do the following:

- Limit maximum arresting force on an employee to 900 pounds (4kilonewtons) when used with a body belt
- Limit maximum arresting force on an employee to 1,800 pounds (8kilonewtons) when used with a body harness
- Be rigged so that an employee can neither free fall more than 6feet (1.8 meters) nor contact any lower level
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 meters)
- Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 meters) or the free fall distance permitted by the system, whichever is less.
- The use of body belts for fall arrest is prohibited and a full body harness is required.
- Personal fall arrest systems must be inspected prior to each use for wear damage, and other deterioration. Defective components must be removed from service.

Positioning Device Systems

- Body harness systems are to be set up so that workers can free fall no farther than 2 feet (0.6 meters). They shall be secured to an anchorage capable of supporting a least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kilonewtons), whichever is greater.

Safety Monitoring Systems

When no other alternative fall protection has been implemented, the employer shall implement a safety monitoring system. Employers must appoint a competent person to monitor the safety of workers and the employer shall ensure that the safety monitor:

- Is competent in the recognition of fall hazards
- Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices
- Is operating on the same walking/working surfaces of the workers and can see them
- Is close enough to work operations to communicate orally with workers and has no other duties to distract from the monitoring function.
- Mechanical equipment shall not be used or stored in areas where safety-monitoring systems are being used to monitor employees engaged in roofing operations on low-sloped roofs.
- No worker, other than one engaged in roofing work (on low-sloped roofs) or one covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.
- All workers in a controlled access zone shall be instructed to promptly comply with fall hazard warnings issued by safety monitors.

Safety Net Systems

Safety nets must be installed as close as practicable under the walking/working surface on which employees are working and never more than 30 feet (9.1 meters) below such levels. Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, and other deterioration. Safety nets shall be installed with sufficient clearance underneath to prevent contact with the surface or structure below.

Items that have fallen into safety nets including, but not restricted to, materials, scrap, equipment, and tools must be removed as soon as possible and at least before the next work shift.

Warning Line Systems

Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

- Flagged at not more than 6-foot (1.8 meters) intervals with high-visibility material

- Rigged and supported so that the lowest point including sag) is no less than 34 inches (0.9 meters) from the walking/working surface and its highest point is no more than 39 inches (1 meter) from the walking/working surface
- Stanchions, after being rigged with warning lines, shall be capable of resisting, without tipping over, a force of at least 16 pounds 71newtons) applied horizontally against the stanchion, 30 inches (0.8 meters) above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge
- The rope, wire, or chain shall have a minimum tensile strength of 500 pounds (2.22 kilonewtons) and after being attached to the stanchions, must support without breaking the load applied to the stanchions as prescribed above
- Shall be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.

Warning lines shall be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line shall be erected not less than 6 feet (1.8 meters) from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet (3 meters) from the roof edge perpendicular to the direction of mechanical equipment operation.

When mechanical equipment is not being used, the warning line must be erected not less than 6 feet (1.8 meters) from the roof edge.

Covers

Covers located in roadways and vehicular aisles must be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected. All other covers must be able to support at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time. To prevent accidental displacement resulting from wind, equipment, or workers activities all covers must be secured. All covers shall be color-coded or bear the markings "HOLE" or "COVER."

Protection From Falling Objects

When guardrail systems are used to prevent materials from falling from one level to another, any openings must be small enough to prevent passage of potential falling objects. No materials or equipment except masonry and mortar shall be stored within 4 feet (1.2 meters) of working edges. Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept clear of the working area by removal at regular intervals.

During roofing work, materials and equipment shall not be stored within 6 feet (1.8

meters) of a roof edge unless guardrails are erected at the edge, and materials piled, grouped, or stacked near a roof edge must be stable and self-supporting.

Training

Employees will be trained in the following areas:

a. The nature of fall hazards in the work area
b. The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems
c. The use and operation of controlled access zones and guardrail, personal fall arrest, safety net, The role of each employee in the safety monitoring system when the system is in use
d. The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs
e. The correct procedures for equipment and materials handling and storage and the erection of overhead protection
f. Employees role in fall protection plans.

Policy Number: SP185
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Electrical Safety Program

Purpose:

The Electrical Safety program is designed to make employees aware of the inherent hazards associated with working on, near or with electrically powered equipment, tools, machines or systems. Electricity has long been recognized as a serious workplace hazard, exposing employees to such dangers as electric shock, electrocution, fires and explosions. References: NFPA 70E, Electrical Safety Requirements for Employee Workplaces, National Electrical Code (NEC) and OSHA Standard (Electrical Safety) 29 CFR 1910.331 to 1910.339

Applicability:

Electrical safety applies to all employees. In regard to the topic of electrical safety all Triangle Services are classified as either "Un-Qualified" or "Qualified" workers. The procedure will present the information, policies and procedures for both classifications.

Procedure:

Responsibilities

Management

- Provide training for qualified and unqualified employees
- Conduct inspections to identify electrical safety deficiencies
- Guard and correct all electrical deficiencies promptly
- Ensure all new electrical installations meet codes and regulations
- Ensure that qualified employees that are assigned electrical tasks have the required skills as indicated by education and work experience to safely complete the assigned task.

Employees

- Properly inspect all electrical equipment prior to use
- Report electrical deficiencies immediately
- Don't work on electrical equipment unless authorized and trained

Hazard Control

Engineering Controls

- All electrical distribution panels, breakers, disconnects, switches, junction boxes shall be completely enclosed
- Watertight enclosure shall be used where there is possibility of moisture entry either from operations or weather exposure
- Electrical distribution areas will be guarded against accidental damage by locating in specifically designed rooms, use of substantial guard posts and rails and other structural means
- A clear approach and 3 foot side clearance shall be maintained for all distribution panels.
- All conduits shall be fully supported throughout its length. Non-electrical attachments to conduit are prohibited.
- All non-rigid cords shall be provided with strain relief where necessary.

Administrative Controls

- Only trained and authorized employees may conduct repairs to electrical equipment.
- Contractors performing electrical work must hold a license for the rated work
- Areas under new installation or repair will be sufficiently guarded with physical barriers and warning signs to prevent unauthorized entry
- Access to electrical distribution rooms is limited to those employees who have a need to enter
- All electrical control devices shall be properly labeled
- Work on energized circuits is prohibited unless specifically authorized by senior facility management
- All qualified employees will follow established electrical safety procedures and precautions

Protective Equipment

- Qualified employees will wear electrically rated safety shoes/boots.
- All tools used for electrical work shall be properly insulated
- Electrical rated gloves shall be available for work on electrical equipment
- Electrically rated matting will be installed in front of all distribution panels in electric utility rooms

Electrical Equipment

Examination

Electrical equipment shall be free from recognized hazards that are likely to cause injury, property damage or death. Safety of equipment shall be determined using the following considerations**:**

- Suitability for installation and use in conformity with the provisions of this subpart. Labeling the equipment is considered suitable for identifying the purpose and use of the equipment.
- Mechanical strength and durability of the equipment, including parts designed to enclose, protect other equipment, and the adequacy of the protection provided.
- Electrical insulation.
- Heating effects under conditions of use.
- Arcing effects.
- Classification by type, size, voltage, current capacity, and specific use.
- Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

Identification of Disconnecting Means and Circuits

Each disconnecting means for motors and appliances shall be legibly marked to indicate its purpose. Each service, feeder, and branch circuit, at its disconnecting means or over current device, shall be legibly marked to indicate its purpose. These markings shall be of sufficient durability to withstand the environment involved.

A disconnecting means is a switch that is used to disconnect the conductors of a circuit from the source of electric current. Disconnect switches are important because they enable a circuit to be opened, stopping the flow of electricity, and thus can effectively protect workers and equipment.

Each disconnect switch or over current device required for a service, feeder, or branch circuit must be clearly labeled to indicate the circuit's function, and the label or marking should be located at the point where the circuit originates. For example, on a panel that

controls several motors or on a motor control center, each disconnect must be clearly marked to indicate the motor to which each circuit is connected. All labels and markings must be durable enough to withstand weather, chemicals, heat, corrosion, or any other environment to which they may be exposed.

Definition of Terms

Qualified Electrical Worker: An employee trained and authorized to conduct electrical work, including work on or near energized electrical equipment and the application of an electrical circuit lockout/tagout.

Unqualified: Employees who have not been trained or authorized by management to conduct electrical work.

Training for Unqualified Employees

Training for Unqualified Employees should start upon employee start date. The training should be general electrical safety precautions, to provide an awareness and understanding of electrical hazards. The general electrical safety precautions for unqualified employees are:

1. Do not conduct any repairs to electrical equipment
2. Never reset a breaker or replace a blown fuse
3. Report all electrical deficiencies to your supervisor
4. Do not operate equipment if you suspect any electrical problem
5. Water and electricity do not mix.
6. Power strips require a built in circuit breaker and should never be connected together, or “daisy-chained”.
7. Do not use cords or plugs if the ground prong is missing
8. Do not overload electrical receptacles. One plug per outlet ONLY!

Training for Qualified Electrical Workers

In addition to the training provided to unqualified workers, Qualified Electrical Workers will receive training in the following area:

1. Familiarization with OSHA standard 29 CFR 1910.147
2. Familiarization with OSHA standards 29 CFR 1910.331-339
3. Completion of the NFPA 70 E seminar Electrical Safety in the Work Place
4. Familiarization with corporate energized work permit procedure
5. Familiarization with required tables concerning personal protection in the NFPA 70 E manual.
6. Successful completion of electrical lock out, tag out training, to include a written test and the demonstration of proper application of LOTO on all types of electrically powered facility equipment.
7. Successful completion of the Certification Exam for Qualified Electrical Workers.

8. Demonstration of the skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
9. Demonstration of the skills and techniques necessary to determine the nominal voltage of exposed live parts,

Additional Requirements for Qualified Electrical Workers

In addition to the training requirements, a worker must have a sufficient work background that includes maintenance of electrically powered equipment and/or formal education in an electrical/electronic discipline.

Management Responsibilities for Qualified Electrical Workers

It is the responsibility of the site management team to ensure that a candidate for training to become a qualified electrical worker has a sufficient background to ensure that they have the prerequisite knowledge and understanding of the fundamentals of electricity, electrical testing equipment, electrical troubleshooting techniques and electrical hazards to work safely on or near electrically energized equipment.

Additionally, it is the responsibility of the site management team to assign electrical tasks to qualified electrical workers that are within the skill sets of each individual worker, based on a workers previous work/educational background.

Tasks That Require a Qualified Electrical Worker

Simply stated, ANY task that needs to be completed on an electrically powered tool, machine, equipment, circuit or device, beyond the normal operation of that tool, machine, equipment, circuit or device, must be completed by a Qualified Electrical Worker. The following is a list of some examples of items that would be required to be performed by a Qualified Electrical Worker.

- The application of a Lockout/Tagout on an electrical circuit.
- Resetting a tripped circuit breaker
- Replace a blown fuse
- Replace a damaged circuit breaker
- Operate a disconnect on faulty equipment
- Take voltage measurements (volts, amps)
- Removing a cover or guard to expose energized electrical circuits or components
- Opening a door that would expose energized electrical circuits or components
- Applying grounding straps to de-energized equipment
- Removing or replacing an energized motor controller
- Replacing a circuit board or component in energized equipment
- Reading a panel meter while operating a switch on equipment operating at greater than 600 volts

- Replacing lighting ballasts
- Making contact with any electrical circuit, component, conductor or device if it is energized, or suspected to be energized.

Lockout/Tagout of Electrical Circuits

General

Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

Deenergized parts

Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the employer can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Energized parts

If the exposed live parts are not deenergized (i.e., for reasons of increased or additional hazards or infeasibility), other safety-related work practices in accordance with NFPA 70 E shall be used to protect employees who may be exposed to the electrical hazards involved. Such work practices shall protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts.

Deenergizing Equipment

Safe procedures for deenergizing circuits and equipment shall be determined before circuits or equipment is deenergized.

The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for deenergizing circuits or equipment.

Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.

Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

Stored non-electrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

Application of Locks and Tags

A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed. The lock shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

A tag used without a lock shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

A lock may be placed without a tag only under the following conditions:

- Only one circuit or piece of equipment is deenergized, and
- The lockout period does not extend beyond the work shift, and
- Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

Verification of Deenergized Condition

A Qualified Electrical Worker shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

A Qualified Electrical Worker shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back-feed even though specific parts of the circuit have been deenergized and presumed to be safe. The test equipment shall be checked for proper operation immediately after this test.

Reenergizing Equipment

These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

A Qualified Electrical Worker shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.

Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a member of the site management team or a designated Qualified Electrical Worker, provided that:

- The employer ensures that the employee who applied the lock or tag is not available at the workplace, and
- The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.

There shall be a visual determination that all employees are clear of the circuits and equipment.

Overhead Lines

If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

Unqualified Persons

When an unqualified person is working in an elevated position or on the ground near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

- For voltages to ground 50kV or below - 10 feet (305 cm);
- For voltages to ground over 50kV - 10 feet (305 cm) plus 4 inches (10 cm) for every 10kV over 50kV.

Note: For voltages normally encountered with overhead power line, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

Qualified Electrical Workers

When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in table unless:

- The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or
- The energized part is insulated both from all other conductive objects at a different potential and from the person, or
- The person is insulated from all conductive objects at a potential different from that of the energized part.

Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid Contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm).

Vehicular and Mechanical Equipment

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10 kV over that voltage.

If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in the above table.

Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:

- The employee is using protective equipment rated for the voltage; or
- The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in the table above.

If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

Illumination

Employees may not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts. Employees may not reach blindly into areas which may contain energized parts.

Confined or Enclosed Work Spaces

If an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

Conductive Materials and Equipment

Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, the employer shall institute work practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazards

Portable Ladders

Portable ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

Conductive Apparel

Conductive articles of jewelry and clothing (such a watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) may not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

Housekeeping Duties

Where live parts present an electrical contact hazard, employees may not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided. Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

Interlocks

Only a Qualified Electrical Worker following the requirements of this procedure may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

Work On Or Near Energized Electrical Equipment

It is the policy of Triangle Services that electrically powered equipment must be de-energized, with a proper lockout/tagout applied, prior to performing preventive or corrective maintenance.

In specific instances, electrically powered equipment will need to be energized during the maintenance process. The section of this procedure entitled "Justification for Work" details the specific instances when maintenance can be performed on energized electrical equipment. If none of the listed conditions are met, work on energized electrical equipment is prohibited, and the equipment must be placed in an electrically safe condition prior to performing any maintenance task.

If it is determined that maintenance must be performed on electrically powered equipment while it is energized, an Energized Electrical Work Permit (SFTY04) must be completed prior to performing any maintenance tasks. This procedure details the steps required to complete an Energized Electrical Work Permit.

Operation of circuit breakers, disconnects, motor controller over-current protection and other similar devices, that are fully enclosed by NEMA enclosures can be operated without the completion of an Energized Electrical Work Permit. Prior to operation of these types of devices, proper protective clothing must be donned. Proper protective clothing can be determined by completing an Energized Electrical Equipment Analysis Worksheet (SFTY05), or by referring to tables 130.7(C)(9)(a) and 130.7(C)(10) located in the NFPA 70E standards manual.

Diagnostic measurements, such as voltage or amperage measurements, can be performed on energized electrical equipment during the performance of a standard, preventive maintenance task provided the PM work order instructions specifically detail the required tools, clothing and personal protective equipment for the voltage under test. The proper tools, clothing and personal protective equipment can be determined by completing an Energized Electrical Equipment Analysis Worksheet (SFTY05), or by referring to tables 130.7(C)(9)(a) and 130.7(C)(10) located in the NFPA 70E standards manual.

Prior to performing any work that requires the completion of an Energized Electrical Work Permit, a copy of NFPA 70E must be made available to the Qualified person who will be performing the work. A current copy of NFPA 70E can be obtained at http://www.nfpa.org/catalog/product.asp?pid=70E04&order_src=A291.

Justification for Work

Live parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee works on or near them, unless it can be demonstrated that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Energized parts that operate at less than 50

volts to ground shall not be required to be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

- Examples of increased or additional hazards include, but are not limited to, interruption of life support equipment, deactivation of emergency alarm systems, and shutdown of hazardous location ventilation equipment.
- An example of infeasibility due to equipment design or operational limitations include performing diagnostics and testing of electrical circuits that can only be performed with the circuit energized in order to troubleshoot a problem during corrective maintenance.
- Interruption of production or inconvenience is NOT an example of infeasibility, and would require the equipment to be placed in an electrically safe work condition if this were the sole justification for working on energized electrical equipment.

Energized Electrical Work Permit

(1) Where Required: If live parts are not placed in an electrically safe work condition, work to be performed shall be considered energized electrical work and shall be performed by written permit only

(2) Elements of Work Permit: The energized electrical work permit includes the following items.

(a) A description of the circuit and equipment to be worked on and their location. This is a short description of the equipment, such as make, model, and function, and where the equipment is physically located within the facility.
    - Example 1: Portec Powerturn, 90 degree. One section of a package conveyor train. Located at column 6b.
    - Example 2: Heiser Ventilation Fan. Portion of Hazmat Room ventilation system. Located on roof, over hazmat room.

(b) Justification for why the work must be performed in an energized condition. This field will start with either “Hazard”, “Infeasibility” or “Less than 50 V”. Following this initial identifier, a short narrative is required to explain why the equipment must be worked on while energized.
    - Example 1: Infeasibility. Electrical troubleshooting of a fault is in progress and the equipment must be energized to complete this step.
    - Example 2: Hazard. Replacing circuit breaker for ventilation fan, which is one of three fans powered from the panel board that serves the hazmat room. Hazmat room requires constant ventilation to ensure safety of facility personnel.

(c) A description of the safe work practices to be employed. This can be found in section 110.8(B) of NFPA 70E.
    - Example 1: Unqualified employees will be prevented from entering the work area by establishing shock and flash boundaries. Qualified

employees will be protected by utilizing the proper PPE, tools, clothing and procedure.

- Example 2: Unqualified employees will be prevented from entering the work area by establishing shock and flash boundaries. Qualified employees will be protected by utilizing the proper PPE, tools, clothing and procedure.

(d) Results of the shock hazard analysis. Section 110.8(B)(1)(a) of NFPA 70E
- Example 1: Powerturn operates at 480 V and will therefore require shock boundaries, PPE, proper clothing and insulated tools.
- Example 2: Ventilation fan operates at 240 V and will therefore required shock boundaries, PPE, proper clothing and insulated tools.

(e) Determination of shock protection boundaries. This can be found by referring to table 130.2(C) of NFPA 70E.
- Example 1: Limited Approach Boundary is 3.5 feet, Restricted Approach Boundary is 3.5 feet, Prohibited Approach Boundary is 1 inch.
- Example 2: Limited Approach Boundary is 3.5 feet, Restricted Approach Boundary is avoid contact, Prohibited Approach Boundary is avoid contact.

(f) Results of the flash hazard analysis. Section 130.3 of NFPA 70E.
- Example 1: Flash Protection Boundary will be required.
- Example 2: Flash Protection Boundary will be required.

(g) Determination of the flash protection boundary. This can be found referring to section 130.3(A) of NFPA 70E.
- Example 1: Voltage is less than 600 V, therefore the Flash Protection Boundary is 4.0 feet.
- Example 2: Voltage is less than 600 V, therefore the Flash Protection Boundary is 4.0 feet.

(h) The necessary PPE to safely perform the assigned task. This can be determined by referring to tables 130.7(C)(9)(a) and 130.7(C)(10) located in the NFPA 70E standards manual.
- Example 1: Cotton T-shirt, FR long sleeve shirt, FR pants (arc rating 8) or FR pants (arc rating 4) over natural fiber pants or coverall (arc rating 4) over natural fiber pants, hard hat, safety glasses/goggles, arc-rated (8) face shield or flash suit hood, ear canal inserts, v-rated gloves, leather glove protectors, insulated tools, leather work shoes.
- Example 2: Same as example 1.

(i) Means employed to restrict access of unqualified persons from entering the work area. Section 110.8(A)(2) of NFPA 70E.
- Examples 1: Rope boundaries will be placed around the work area with warning signs attached. As this is a high traffic area, a boundary observer will be stationed to ensure that all personnel observe the established boundary.
- Example 2: Rope boundaries will be placed around the work area with warning signs attached. As this work is being done in a restricted access area, no boundary observer will be posted.

(j) Evidence of completion of a job briefing, including a discussion of any job-specific hazards as outlined in section 110.7(G). This evidence is best established by attaching a copy of the written procedure to be used to the work permit. The written procedure should be signed by all workers who will be performing tasks, signifying that they have been briefed on the procedure, and understand their responsibilities and the hazards that are involved.
    - Example 1: Briefing completed on 8/16/06. Personnel included in this briefing were John Doe, Jane Smith, and Joe Cool. A copy of the procedure that the briefing covered is attached to this permit.
    - Example 2: Same as example 1

(k) Energized work approval signatures. If the equipment to be worked on is client owned, a client representative must also sign approval of the permit.

Work Procedure

A detailed work procedure must be developed and written, before a work permit can be obtained. At a minimum, the following items must be included in the procedure:

(1) A description of the equipment under repair
(2) A description of the fault or problem that must be corrected.
(3) A step-by-step work instruction required to complete the maintenance, including who will be performing each step.
(4) A description of any potential hazard that may exist, and what action(s) will be employed to minimize these hazards.

Policy Number: SP190
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Lockout, Tag out of hazardous energy sources (NON-ELECTRICAL)

Purpose:

The purpose of this policy is to cover the servicing and maintenance of machines and equipment in which the **unexpected** energization or start up of the machines or equipment, or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

Applicability:

This policy applies to all employees that are authorized and assigned tasks that require the lock out and tag out of energy sources. This procedure does NOT apply to the lock out and tag out of electrical sources. For information concerning the lock out and tag out of electrical sources refer to the Electrical Safety section of this safety manual.

Procedure:

This standard does not cover installations under the exclusive control of electric utilities for the purpose of power generation, transmission and distribution, including related equipment for communication or metering; and exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations,

Application.

This procedure applies to the control of energy during servicing and/or maintenance of machines and equipment. Normal production operations are not covered by this procedure. Servicing and/or maintenance which takes place during normal production operations is covered by this procedure only if:

- An employee is required to remove or bypass a guard or other safety device; or

- An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

This procedure does not apply to the following:

- Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.
- Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that the employer demonstrates that-
- continuity of service is essential;
- shutdown of the system is impractical; and
- documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

Purpose.

has established a program and utilized procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start up or release of stored energy in order to prevent injury to employees.

Definitions applicable to this section.

Affected employee. An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized employee. A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of being locked out. An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized. Connected to an energy source or containing residual or stored energy.

Energy isolating device. A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy source. Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot tap. A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. it is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout. The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device. A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Normal production operations. The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance. Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the **unexpected** energization or startup of the equipment or release of hazardous energy.

Setting up. Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout. The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout device. A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

General

Energy control program. has established a program consisting of energy control procedures, employee training and periodic inspections to ensure that to ensure that equipment is placed in a safe condition prior to service or maintenance.

Full employee protection.

When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached, and the employer shall demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, the employer shall demonstrate full compliance with all tagout-related provisions of this standard together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include the implementation of additional safety measures such as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

Energy control procedure.

Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in maintenance. The procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

- A specific statement of the intended use of the procedure;
- Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
- Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and
- Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

Protective materials and hardware.

Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by site management for isolating, securing or blocking of machines or equipment from energy sources.

Lockout devices and tagout devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

Durable.

Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

Standardized. Lockout and tagout devices shall be standardized within the facility in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized.

Substantial

Lockout devices. Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

Tagout devices. Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all environment-tolerant nylon cable tie.

Identifiable. Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: **Do Not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate.**

Periodic Inspection.

Triangle Services shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed.

- The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.
- The periodic inspection shall be conducted to correct any deviations or inadequacies identified.
- Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.
- Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected.
- The site manager shall certify that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

Training and communication.

The site management team shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:

- Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
- Each affected employee shall be instructed in the purpose and use of the energy control procedure.
- All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

When tagout systems are used, employees shall also be trained in the following limitations of tags:

- Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
- When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

- Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
- Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
- Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

Employee Retraining.

Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever the employer has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

The site management team shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

Energy isolation. Lockout or tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.

Notification of employees. Affected employees shall be notified by the site management team, or authorized employee, of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

Application of control. The established procedures for the application of energy control (the lockout or tagout procedures) shall cover the following elements and actions and shall be done in the following sequence:

Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

Lockout or tagout device application.

Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

Lockout devices, where used, shall be affixed in a manner to that will hold the energy isolating devices in a "safe" or "off" position.

Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.

Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

Stored energy.

Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

Verification of isolation. Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished.

Release from lockout or tagout. Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

The machine or equipment. The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

Employees: The work area shall be checked to ensure that all employees have been safely positioned or removed.

After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.

Lockout or tagout devices removal. Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. **Exception;** When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the site management team, provided the following conditions are met:

- Verification by the site management team that the authorized employee who applied the device is not at the facility:
- Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and
- Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.

Additional requirements.

Testing or positioning of machines, equipment or components thereof. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions shall be followed:

- Clear the machine or equipment of tools and
- Remove employees from the machine or equipment
- Remove the lockout or tagout devices
- Energize and proceed with testing or positioning;
- Deenergize all systems and reapply energy control measures in accordance with previous steps of this section to continue the servicing and/or maintenance.

Outside personnel (contractors, etc.).

Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the site management team and the outside employer shall inform each other of their respective lockout or tagout procedures.

The site management team shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.

Group lockout or tagout.

When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

Group lockout or tagout devices shall be used in accordance with the stated procedures of this section including, but not necessarily limited to, the following specific requirements:

- Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock);
- Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment and
- When more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and
- Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

Shift or personnel changes. Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

TEMPLATE
LOTO PROCEDURE

Lockout Procedure for

_____

(Name of Company for single procedure or identification of equipment if multiple procedures are used).

Purpose

This procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing is done on machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

Compliance With This Program

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance shall not attempt to start, energize, or use that machine or equipment.

_____

Type of compliance enforcement to be taken for violation of the above.

Sequence of Lockout

(1) Notify all affected employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.

_____

Name(s)/Job Title(s) of affected employees and how to notify.

(2) The authorized employee shall refer to the company procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.

_____

Type(s) and magnitude(s) of energy, its hazards and the methods to control the energy.

(3) If the machine or equipment is operating, shut it down by the normal stopping procedure (depress the stop button, open switch, close valve, etc.).

_____

Type(s) and location(s) of machine or equipment operating controls.

(4) De-activate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).

_____

Type(s) and location(s) of energy isolating devices.

(5) Lock out the energy isolating device(s) with assigned individual lock(s).

(6) Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

_____

Type(s) of stored energy - methods to dissipate or restrain.

(7) Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.

Caution: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

_____

Method of verifying the isolation of the equipment.

(8) The machine or equipment is now locked out.

Restoring Equipment to Service. When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken.

(1) Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

(2) Check the work area to ensure that all employees have been safely positioned or removed from the area.

(3) Verify that the controls are in neutral.

(4) Remove the lockout devices and reenergize the machine or equipment.

Note: The removal of some forms of blocking may require reenergization of of the machine before safe removal.

(5) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

Policy Number: SP200
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Boiler Safety

Purpose:

The Boiler Safety Program has been developed from the requirements listed by the American Society of Mechanical Engineers (ASME) and the National Board Inspection Code. This chapter provides guidance for the safe operation and maintenance of pressure boilers. Following this program will also extend the serviceable lifetime of boilers and associated equipment.

Applicability:

All employees required to operate or maintain a boiler system.

Procedure:

Governing Documents

The following publications are used for training, operating, maintaining, and testing of all boilers:

Manufacturer's Technical Manual

ASME Boiler & Pressure Vessel Code, Section VII, *Recommended Guidelines for the Care of Power Boilers*

ASME CSD-1, *Controls and Safety Devices For Automatically Fired Boilers*

Records

- Inspection records provided by outside organizations are to be maintained on file permanently.
- Repair and Maintenance records are to be maintained on file permanently.
- Weekly/Monthly Boiler Inspection records (self inspection) are to be reviewed and filed each month.
- Monthly Chemical Analysis reports, by the chemical supplier, are to be maintained for one year.
- Safety Device Tests/Check records are to be maintained for one year on a most recent basis.
- Safety Valve Certification records, provided by a valve shop, are to be maintained on a most recent basis.

Hazards

Boiler operation hazards include steam/hot water burns, burns from hot equipment, steam explosions, fuel fires and chemical exposure.

Hazard Control

Engineering Controls: Engineered boiler safety controls include insulation of hot areas such as piping and boiler components, automatic shutdown devices, automatic fire and fuel controls, relief valves and water level controls.

Administrative Controls: Administrative procedures include operator training, chemical control procedures, operating procedures, inspections, audits, water chemistry control and planned maintenance.

External Inspections

A certified boiler inspector should conduct all External inspections annually.

External Inspection Areas:

1. Leaks: Leaks cause an excessive make-up rate to the boiler which will cause increased introduction of oxygen and a reduction in oxygen control chemicals. This action will result in higher corrosion
2. rates inside the boiler and an increase in scale and sludge buildup. This effect will, in turn, reduce boiler efficiency requiring a higher fuel consumption. Additionally, the life of the boiler will be
3. significantly reduced. External components are also affected by leaks. Wetted thermal insulation will create an ideal environment for accelerated corrosion of pipes and valves. Failure of these types of components, due to external corrosion, can be severe and with little or no advance warning. For this reason, wetted insulation should not be

allowed to exist on any boiler or boiler support system. Discolored insulation indicates current or previous wetting.

4. Indicating Devices: All indicating devices such as gages, thermometers, gage glasses, etc. are to be kept in good repair. Devices that are damaged or not reading correctly shall be replaced as soon as possible.
5. Safety Devices: All safety devices such as boiler cutoffs, low water level alarms, burner failure alarms and safety valves must be kept free of mechanical and electrical defects. Safety Valves should have no evidence of leakage either from the valve stem, telltales or escape piping. All Safety valves must have a stamped label indicating last test date and pressure rating.
6. Control Systems: Fuel control systems must be kept clean and free to move. Electrical controls should not have any external electrical safety hazards
7. Valves: All valves are to be free of leakage and clean to ensure proper operation when required for isolation.
8. Housekeeping: All boiler areas should be kept clear of combustible materials. Spills of oil or chemicals should be cleaned up as they occur.
9. Signs All accesses to boiler rooms are to be labeled "High Noise Area- Hearing Protection Required" or similar signage.
10. Piping Supports All piping requires positive support. A check should be made to ensure there is no shifting or loosing of support brackets

Internal Inspections

Internal inspections should normally be conducted annually. The inspection should be performed by a certified boiler inspector.

Internal Inspection Areas:

1. Fire Side inspection points:
    - Door gaskets
    - Fire side insulation
    - Tube sheet
    - Tubes
    - Blower
    - Stack

2. Water Side inspections points:

    - Tube bundle
    - Scale buildup
    - Condensate feed water tanks
    - Chemistry control systems
    - Level floats

Boiler Tests

The following tests are to be conducted at the frequency noted and logged on the check sheet found at the end of this chapter. All tests are to be conducted in accordance with the list of *Governing Documents* listed at the beginning of this chapter.

General Test Procedures

1. Safety/Relief Valve Operational Test (Document Monthly) All safety valves are to be tested in place each month by using the test lever provided. With boiler pressure at least 75% of safety valve set point, fully open the Safety/Relief Valve and let it snap shut. If the valve does not reseat properly, repeat the test. If the Safety/Relief valve cannot be lifted, the boiler must be shutdown immediately until the valve can be repaired or replaced. NOTE: *Excessive hand lifting will shorten the life of the valve. Prior to installation in a boiler system, all safety valves shall be inspected, set and tested by a qualified valve repair shop. The shop should provide documentation of the inspection and methods used to set and test the safety valve.*
2. Check System for Leaks (Document Weekly) The entire system is to be checked closely for leaks daily and documented weekly. Particular attention should be paid to pump and valve packing, automatic air vents, and condensate tank overflow lines. Excessive leaks will result in excessive corrosion and scale buildup in the boiler and result in shortened boiler life.
3. Low Water Fuel Cutoff (LWFCO) Rapid Drain Test (Document Weekly & on Startup) With the burner in operation, rapidly flush the LWFCO chamber using the drain valve provided. The burner must shut off when the device is drained. If the boiler does not have at least one properly functioning LWFCO, it must not be left unattended, while operating, until repairs are made. ENSURE VISUAL AND AUDIBLE ALARMS FUNCTION PROPERLY.
4. Burner Check (Document Monthly) Observe the boiler and burner for a long enough period to be certain that the burner operates normally. Test the Combustion Safeguard System.
5. Water Chemistry Check (Document Monthly) Ensure contracted vendor has conducted proper water chemistry checks and provided support documents. Conduct action recommended on report to maintain proper chemistry.
6. LWFCO Slow Drain Test (Document Quarterly) With the burner in operation, verify the function of the LWFCO by slowly reducing the level of the water in the boiler. *Great care* must be taken to prevent actually firing the boiler with insufficient water.
7. Circ and/or Condensate Pump Check (Document Quarterly with the LWFCO Test) When conducting the LWFCO test, verify operation of the condensate pump and/or emergency feeder.
8. Safety Valve Set point Test (Document Annually) Safety and relief valves are to be tested annually to ensure they are set correctly and are in proper operational

condition. Normally this can be accomplished while the boiler is shutdown for annual internal inspection.

9. Drain Water Gage Glass (As necessary) *Danger: Possibility of escaping hot water/steam can cause burns.* If necessary, to remove suspended or floating impurities, drain and flush the water column and gage glass by shutting the top and bottom isolation valves of the gage glass then slowly crack open gage glass drain. Shut gage glass drain after water column has drained. *Slowly* open upper gage glass isolation valve then slowly open lower gage glass drain. Water level should immediately rise in the gage glass

Blow downs

Boilers should be blown down (surface and bottom) daily. Surface blow downs are conducted to remove surface film, oil etc.. Bottom Blow Downs are conducted to lower Total Dissolved Solids (TDS), limit sludge buildup and adjust boiler chemistry. When conducting Blow Downs, the operator must ensure that all persons are clear of the lowdown piping escape point.
Simultaneous blow down of two or more boilers is not to be performed if they are serviced by the same discharge piping system.

Water Chemistry

Boiler chemicals are caustic and are to be handled by trained personnel only. Proper PPE, as indicated on the MSDS, is to be used at all times. Spills of boiler chemicals are to be cleaned up as they occur.

Operating Parameters

Operation of the boiler in the proper ranges will help ensure the mechanical integrity and expected lifetime of the boiler. The following information is provided to assist operators in analyzing trends.

- pH: If Boiler water pH is low, accelerated general corrosion (rust) will occur. If pH is too high, caustic and oxygen pitting corrosion will occur. Both types of corrosion reduce the life of the boiler.
- Stack temperature: Stack temperature should be in the range of 300 to 400 degrees (depending on the boiler load). An excessively high stack temperature indicates that the efficiency of the boiler has been significantly reduced.
- Steam Pressure: Steam pressure should never exceed 150 psi unless part of an approved test, such as pressure lift check of safety valves.

Pre-Startup Checks

Prior to firing a boiler all pre-startup checks recommended by the manufacturer are to be conducted.

Automatic Boiler Shutdown Checks

Daily, generally during startup, all automatic boiler shutdown devices are to be checked to ensure proper operation. These include but are not limited to:

- Flame Out Shutdown Device
- Low Water Level Alarm and Boiler Shutdown Device

Daily Checks

The following checks should be conducted daily when boiler is operating

- Checks for leakage of water, steam or fuel
- Wetted thermal insulation
- Pipe supports for proper alignment and condition
- Boiler area clear of debris and combustible material
- Low water level shutdown and alarm
- Flame out shutdown
- Safety valves not obstructed or leaking
- Gages, thermometers and gage glasses are readable and functioning

Extended Shutdown

If a boiler is to be shutdown for greater than 12 to 24 hours it should be placed in a full wet lay-up condition. This condition will limit the general corrosion activity to below that which would occur if the boiler were left in a partial or full drain condition.

Maintenance

All maintenance should be controlled such that replacement parts with the proper rating are used. Substituting improper materials or parts can result in a boiler explosion or catastrophic rupture of the steam system. All maintenance is to be carried out under the Lockout /Tagout, Confined Space Entry, Electrical Safety, and Hot Work programs as applicable. Special care must be taken to ensure that the thermal energy associated with the boiler has been dissipated prior to commencing maintenance.

Valves:

A Packing adjustment on steam valves is not to be done unless the valve has been depressurized.

Pumps:

Packing adjustments on pumps should be performed with the pump running. Adjustments should be made one flat at a time. Excessive tightening over a short period of time can cause pump shaft sleeve damage that will result in an increase in shaft packing leaks.

General, pumps without mechanical seals at the shaft should have a leakage of a minimum of 2 drops per second and a maximum of 6 drops per second. This leakage provides cooling and lubrication for the shaft packing.

Gaskets:

Whenever a mechanical joint has been disassembled, new gasket material of the proper type must be used for reassembly. Old gaskets are never to be reused.

Boiler Accidents

Boiler systems are designed for safety and efficiency. The key to safe boiler operation is the operator. History has shown that without proper operation and maintenance, boiler conditions and safety deteriorate, causing potential hazards due to neglect and misunderstanding.
Leading causes of accidents:

1. Failure of the fuel cutoff system when the water level inside the unit becomes too low for proper operation.
2. Operator error, poor maintenance, or improper maintenance.
3. Failure of any primary safety controls and failure of the safety relief valve (which should relieve the excess pressure or excessively high temperature water supply inside the tank when pressure or temperature rises above a safe operating level due to the failure of primary safety controls).
4. The addition of cold water to an extremely overheated water heater or boiler.

Common Boiler Room Accidents

Dry Fire Accidents: Dry fire accidents are also called boiler meltdowns. These accidents occur when the boiler is allowed to operate without adequate water in the boiler. Functioning low water cutoffs are essential to preventing dry fire accidents. Boiler damage can run from severe buckling and deforming of the boiler to complete meltdown or potential boiler explosion.

Excessive Pressure Accidents: Excessive pressure is potentially the most lethal form of boiler accident. These accidents occur when the boiler can no longer contain the excessive pressure allowed to build in the boiler. The operator control, high-pressure limit, and the pressure relief valve need to fail before these accidents can occur. Excessive pressure accidents, even in small boilers, have been known to completely destroy a building.

Fuel Related Accidents: Fuel related accidents usually occur when the operator fails to purge combustible gases from the firebox before ignition is attempted. Never bypass safety devices with jumper wires to restart your boiler. Unintended ignition of unburned combustion gases in the firebox is possible. Leaking fuel valves can also be the cause of

these accidents. If the operator notices any gas odor the boiler should be shut down and the fuel supplier called immediately.

Water Chemistry Control

Boilers are filled with water that contains naturally occurring impurities. Common impurities such as calcium, magnesium and oxygen can, if they are not controlled, affect boiler performance and durability.

All water contains dissolved minerals such as calcium and magnesium. If these minerals are allowed to reach high enough levels in the boiler water they will come out of solution and form as a hard shell on the hot surfaces of the boiler. This hard shell is called scale and is often found on the outside of the fire tubes. Scale insulates the heating surfaces reducing the ability of the fire tubes to transfer heat from the hot combustion to the boiler water. High stack temperatures or ruptured fire tubes are common problems related to scale build up.

Boiler water also contains dissolved gases such as oxygen or carbon dioxide. These gases in the presence of water and metal can cause corrosion. Corrosion eats away the metal affecting the durability of the boiler.

Water treatment strategies: Boiler heating systems lose water through steam and water leaks. Additional water called "makeup water" is added to the boiler to replace these losses. The amount of make up water and the level of naturally occurring impurities in the water will determine the type of water treatment required. Boiler heating systems that have very few leaks will require simple water treatment programs. Your boiler inspector or water treatment professional can assist you in developing a water treatment program. Steam and hot water boilers typically require different water treatment programs.

Steam boilers: Steam boilers are usually treated to prevent scale and corrosion. Scales producing dissolved minerals accumulate in the boiler water when mineral rich make up water replaces mineral free steam and condensate leaks. Strategies to prevent scale attempt to keep the components of scale such as calcium and magnesium suspended in the boiler water or to reduce their concentrations in the boiler water. Draining water from the boiler (bottom lowdown) is a common method for reducing the concentration of solids and to discharge sludge. Adding oxygen-scavenging chemicals to the boiler water reduces corrosion. Boiler water testing is required to ensure that conditions suitable for scale and corrosion are not present.

Hot water boilers: Scale build up is usually not a problem in hot water boilers. Although make up water contains dissolved minerals, system leaks discharge water with an equal amount of dissolved minerals. Since as many minerals are leaving the boiler system as enter it, minerals do not have the opportunity to accumulate in the boiler water.

SOP: Preparations and Safety Precautions for Internal Inspection

Annually, a licensed boiler inspector should work in conjunction with the client's insurance carrier. The inspector inspects each boiler internally. Write Carrier and Phone number here_____.
Proper preparation is necessary to ensure a safe condition exists for the inspection. When a boiler is to be prepared for internal inspection, the water level should not be lowered from normal operating level until the unit has been cooled down. Cool down of Boilers is not to exceed the rate recommended by the manufacturer. Fast cool down can result in cracking and damage to the boiler casing, tubes and welds. Follow all Confined Space Entry procedures.

Preparing a boiler for internal inspection:

1. Lock & Tagout the fuel supply and ignition systems
2. Shut, Lock & Tagout all system isolation valves for steam, gas, water and feed systems. Open drain valves or cocks between any two closed valves before opening the manholes and entering any part of a boiler which is connected to a common header with other boilers or other sources of steam. Alternatively, lines may be blanked or sections of pipe removed. All drains and vent valves must be opened.
3. Draw off all water and thoroughly wash out the waterside.
4. Remove manhole and hand-hole plates, washout plugs, as well as inspection plugs in water column connections as required by the inspector.
5. Cool & clean the boiler thoroughly
6. Remove all grates
7. Remove insulation and brickwork as required by the inspector in order to determine the condition of the boiler, headers, furnace, supports or other parts.
8. Remove pressure gages for testing when required by the inspector.
9. Open boiler doors for fireside inspection.
10. Ventilate all accessible areas of the boiler and conduct Confined Space Entry procedures.

Policy Number: SP210
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Compressed Gas

Purpose:

Assure that employees handling compressed gases are adequately trained in the inherent hazards of the cylinders and their contents, as well as proper handling, storage, and use according to OSHA requirements. Compressed gas cylinders can present a variety of hazards due to their pressure and /or contents. This chapter of the safety manual covers requirements that must be followed for the use of all compressed gases. In addition to the standard required work practices for inert gases, hazardous gases may require additional controls and work practices including, but not limited to, the use of gas cabinets, gas monitors, emergency shutoffs, proper equipment design, leak testing procedures, and the use of air supplying respirators for certain highly toxic gases.

Applicability:

All employees and management teams that use or store compressed gas

Procedure:

It is the policy of the Company that all compressed gases be handled, stored, received and used in a safe manner consistent with this chapter. Compressed air shall not be used for cleaning or blow down activities unless air pressure is regulated to below 30 psig, and areas have been isolated from pedestrian traffic.

Responsibilities

Management

- Conduct routine inspections to ensure all policies are enforced, both clients and the Company's.
- Conduct training for all employees in use of compressed gas.

Hazards

Numerous potential physical and health hazards are associated with compressed gases, including explosion, poisoning, impact by containers, fire, asphyxiation, and exposure related illnesses.

Hazard Control

Engineering Controls - Each gas application will have it's own engineering controls depending on the types of hazards and application. Examples of engineering controls are:

- Fume hoods.
- Gas Cabinets.
- Ventilation systems.
- Smoke detectors.
- Sprinkler systems.
- Flow Restrictors.
- Scrubbers.
- Leak Monitors.
- Gas cylinder storage areas.

Administrative Controls - Compressed gas program administrative controls include:

- Employee training.
- Segregation of gas containers.
- Inspections and audits.
- Signs.
- Assignment and use of PPE.
- Identification of authorized employees.
- Procedures for receipt, use and storage.

Compressed Gas Cylinders

Inspection of compressed gas cylinders. Each employer shall determine that compressed gas cylinders under his control are in a safe condition to the extent that this can be determined by visual inspection. Visual and other inspections shall be conducted as prescribed in the Hazardous Materials Regulations of the Department of Transportation (49 CFR parts 171-179 and 14 CFR part 103). Where those regulations are not applicable, visual and other inspections shall be conducted in accordance with Compressed Gas Association Pamphlets C-6-1968 and C-8-1962, which is incorporated by reference as specified in Sec. 1910.6.

The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965
Safety relief devices for compressed gas containers. Compressed gas cylinders, portable tanks, and cargo tanks shall have pressure relief devices installed and maintained in accordance with Compressed Gas Association Pamphlets S-1.1-1963 and 1965 addenda and S-1.2-1963

Compressed Gas Use Applications

Prior to use of any compressed gas, a review of the applicable requirement in the Engineering Controls and Work Practices and Procedures section must be conducted.

Class 1 Application - Use of Inert Gases - Gases which are non-flammable and non-toxic, but which may cause asphyxiation due to displacement of oxygen in poorly ventilated spaces.

Class 2 Application - Use of Flammable, Low Toxicity - Gases that are flammable (at a concentration in air of 13% by volume or have a flammable range wider than 13% by volume), but act as non-toxic, simple asphyxiants (e.g. hydrogen, methane).

Class 3 Application - Use of Pyrophoric Gases and Liquids - Gases or liquids that spontaneously ignite on contact with air at a temperature of 130 F or below.

Class 4 Application - Use of Corrosive, Toxic, and Highly Toxic Gases - Gases that may cause acute or chronic health effects at relatively low concentrations in air

Class 5 Application - Use of Compressed Gases in Fume Hoods

Gas Use Requirements - Engineering Applicability

Required Controls	Class 1	Class 2	Class 3	Class 4	Class 5
Gas Cabinet	--	X[1]	X	X	--
Interlocks	X[2]	X[2]	X[2]	X[2]	X[2]
Emergency Off Button			X	X	
Equipment Enclosed and Ventilated	--	X[1]	X	X	X
Smoke Detection	--	X[2]	X[2]	X[2]	X[2]
Sprinkler Protection	--	X[3]	X[3]	X[3]	X[3]
Emergency Power to Exhaust Ventilation	--	--	X[4]	X[4]	X[4]
Pneumatic Shutoff Valve	--	X[5]	X	X	X
Scrubber	--	--	--	X[2]	X[2]
Vacuum Pump Purge and Interlock	--	--	X	--	--
Flow Restricting Orifice	--	X	X	X	X
Ventilation Alarms	--	--	X	X	X
Eyewash and Showers	--	--	--	X[6]	X[6]
Purge Panel	--	--	X	X	X
Gas Monitor	--	--	X[8]	X[8]	X[8]
Piping and Fittings	X	X	X	X	X
Hardware	X	X	X	X	X
Hardware Review	--	X[9]	X	X	X[9]
Training	X	X	X	X	X
Hardware Information	X	X	X	X	X
Ordering Cylinders	X	X	X	X	X
Cylinder Receiving Procedures	X	X	X	X	X
Cylinder Leak Testing	--	--	X	X	--
Cylinder Storage Procedure	X	X	X	X	X
Cylinder Transport Procedures	X	X	X	X	X
Cylinder Shipping Procedures	X	X	X	X	X
Cylinder Changing Procedures	--	--	X	X	--
Pump Oil Change Procedures	--	--	--	X	--
Equipment Maintenance Procedures	X	X	X	X	X
Liquid Transfer Procedures	X[10]	--	--	--	--
General Work Practices	X	X	X	X	X

Notes

X^1 Not required if flow-restricting orifice is installed in a cylinder valve. May be required for semiconductor applications
X^2 Based on the outcome of hazard review
X^3 Required in lab and inside gas cabinet for new installations
X^4 For new installations
X^5 Typically not required, may be required for semiconductor applications
X^6 For corrosive gases
X^7 See Fume Hood Use
X^8 See Gas Monitoring for details
X^9 See Hazard Review
X^{10} See Cryogenic Liquid

Engineering Controls/Design Considerations

This includes a listing of typical engineering controls, referenced in the matrix above. In some cases, Building Codes may require additional controls. Additional controls or deviations from the controls listed below may also be appropriate for the application such as those required by the OSHA Process Safety Management Program or EPA's Risk Management Program. The appropriate controls should be identified through the hazard review process.

1. Gas Cabinets - With the exception of cylinders containing a non-toxic, flammable gas, and cylinders used in fume hood applications, hazardous gas cylinders must be housed in gas cylinder cabinets. These cabinets must be equipped with sprinkler protection, and must be constructed and ventilated according to State code requirements. These requirements include, but are not limited to, the need to provide 200 fpm airflow at the cabinet window.
2. Interlocks - In addition to automatic shutoff of gas flow due to loss of power or ventilation (described below), it will often be appropriate for an automatic shutdown of gas flow due to conditions such as high system pressure, high gas delivery pressure, loss of vacuum, loss of cooling, or other conditions identified through the hazard review process.
3. Emergency Off - Where gases are used in gas cabinets, the emergency off buttons should be located at the lab doorway. Activation of this button will cause pneumatic valves to shut, stopping gas flow. Typically, this button should kill electrical power to hazardous lab equipment as well.
4. Equipment Enclosures and Ventilation - Experimental apparatus using hazardous gases should be contained in an enclosed and exhausted tool enclosure. These enclosures must be connected to the exhaust ventilation system. Ventilation rates must be sized to allow for 100 fpm of airflow through the largest open enclosure door. Mass flow controllers carrying hazardous gases must be housed in a separate ventilated enclosure (or in an enclosed compartment of a larger tool

enclosure) so that 100 fpm exhaust flow is available at the largest open door to the enclosure. All components should be readily accessible for maintenance.

5. Smoke Detection - All labs using hazardous gases will have a smoke detector that is connected to the building alarm system. In certain cases, it may be necessary to interlock smoke detector activation with the shutdown of hazardous gas flow.
6. Sprinkler Protection - Where hazardous gases are contained in gas cabinets, sprinkler protection should be provided to the interior of the gas cabinet. In some cases, this protection is required by code. Sprinkler protection is recommended in all labs using hazardous materials.
7. Emergency Power - Emergency power is recommended to power exhaust fans connected to hazardous gas enclosures. In certain cases, this protection is required.
8. Pneumatic Shutoff Valves - All corrosive, toxic, flammable, and Pyrophoric gases will contain a normally closed pneumatic shutoff valve, rated for at least full cylinder pressure, and located immediately downstream of the cylinder valve. This valve will shut in the event of power failure, remote actuation of an emergency off button, or other appropriate conditions such as hazardous gas alarm activation.
9. Scrubbers - When hazardous waste gases are generated, it is often advisable to treat/react these gases prior to exhaust from the building. This may involve the use of bubblers in a fume hood or sophisticated units for larger scale hazardous gas processes. Note that in some cases (e.g. minimal volumes of hazardous gases produced) scrubbers may be not necessary or even unadvisable. Where scrubbers are used, they need to be carefully reviewed as part of the hazard review. Maintenance requirements and procedures need to be clearly understood and followed.
10. Vacuum Pumps - Vacuum pumps used for hazardous gases need to be carefully selected. Depending on the gases being pumped, special precautions may be necessary. For processes where Pyrophoric gases are used, pumps need to be continuously purged with nitrogen, with loss of nitrogen flow causing the Pyrophoric gas supply valves to close. Pumps used for oxygen service will need to be prepared for this services which includes the elimination of hydrocarbon oils for use due to flammability concerns. In some cases, such as the use of highly toxic gases, vacuum pumps will need to be housed in a ventilated enclosure.
11. Flow Restrictors - A means to limit hazardous gas flow rates to just over maximum flow needed must be installed immediately downstream of each hazardous gas cylinder. For small scale experiments, such as fume hood use, a needle valve is sufficient. For large cylinders a flow restricting orifice, installed by the gas supplier in the cylinder valve or installed in the gas purge panel is required.
12. Ventilation Alarms - All ducts connected to enclosures used to exhaust hazardous compressed gas cylinders or gas carrying components must be connected to a

ventilation alarm. Typically, activation of this alarm will cause pneumatic gas supply shutoff valves to close.

13. Eyewash and Showers - A safety shower or eyewash with a wand is required to be present in areas where corrosive gases are used or stored.
14. Purge Panels - Where corrosive, Pyrophoric, or toxic gases are in use, the gas installation must include means to adequately purge the area between the cylinder valve and the regulator with an inert gas prior to breaking these connections for maintenance or cylinder change. Inert gases used for this purpose must be used solely for this purpose and not connected to other apparatus. Failure to adequately purge cylinders can result in lack of ability to close the cylinder valve or "regulator creep" which allows full cylinder pressure to be transferred to the low pressure side of the regulator.
15. Piping and Fittings - All gas piping must be compatible with the gases used and capable of withstanding full cylinder pressure. For example, tygon tubing should never be used with hazardous gases or low hazard gases unless one end is open to atmosphere. Fittings should be selected based on the service needs. Face seal or welding fittings should be used for hazardous gas service wherever possible. All gauges and components subject to leakages which carry hazardous gases must be contained in an exhausted enclosure.
16. Hardware - Never lubricate, modify, force, or tamper with a cylinder valve. Use the appropriate regulator on each gas cylinder. Adaptors or homemade modifications can be dangerous. Assure all components of the experimental apparatus that can handle full cylinder pressure or are otherwise protected. Oil or grease on the high-pressure side of an oxygen, chlorine, or other cylinder of an oxidizing agent can lead to an explosion. Whenever back siphoning of chemicals into the cylinder might be a problem, use multiple traps or check valves.

Work Practices and Procedures

1. Hazard Review – A hazard assessment is required for the following processes involving the use of hazardous gases:
    i. New or relocated equipment using a toxic, corrosive, or Pyrophoric gas.
    ii. New or relocated equipment using a flammable gas in a non-standard application Analytical equipment fuel gases, welding, cutting, brazing, and small scale use in fume hoods are considered standard applications.
    iii. Existing gas installations should be self-inspected by the work area supervisor against the requirements listed in this section.
    iv. Existing installations using hazardous gases that are considered to present a significant risk or show design deficiencies will have a hazard review conducted.

2. Training – All persons handling or using cylinders must have basic training. Review of the information contained in this section, review of any additional information in the written safety plan for all work areas, and hands-on assistance by an experienced gas user will meet this minimum requirement. Additional compressed gas safety training can be obtained through the Safety Department.
3. Hazard Information – The gas user must be thoroughly familiar with the properties of each gas they are using. A review of a good quality MSDS is necessary.
4. Ordering – All gas cylinders used by Company employees should be ordered and received through management approval. This allows for proper storage and leak testing of highly toxic gases during the receipt process into the building.
5. Receiving – Be sure the cylinder tag (don't rely on cylinder stenciling or color coding) indicates the gas you have ordered. Hazardous gases (flammable, Pyrophoric, toxic, corrosive) must be transported directly from the shipper to the end use location. No staging of hazardous gases is permitted. Low hazard gases (e.g. inert gases, oxygen, freon) may be stored temporarily in designated locations which provide means for securing cylinders with chains or straps.
6. Leak Testing – Toxic, corrosive, and Pyrophoric gases must be leak tested at the following intervals; receiving, installation, disconnect/shipping. Highly toxic gases are leak tested by the Safety Department prior to delivery to the user. The end user is responsible for other leak test intervals. It is key that toxic gases be leak tested prior to removal from their exhausted enclosures and subsequent transport.
7. Storage – For short-term use of hazardous gases, always select the smallest *returnable* cylinder available. Non-returnable cylinders are strongly discouraged. If non-returnable cylinders must be used, you must have a way to treat the remaining contents of the cylinder so that the cylinder valve can be removed prior to disposal. In cases where the gas will be used over an extended period of time (several months to more than one year), you should order a gas quantity that will last for three to six months. Corrosive gases should be returned to the gas supplier within one year to avoid regulator and cylinder valve problems due to corrosion. In storage, restrain cylinders of all sizes by straps, chains, or a suitable stand to prevent them from falling. Segregate full cylinders of low hazard gases from "empty" cylinders awaiting return to the vendor. Assure hazardous gas cylinders are constantly stored in a suitable exhausted enclosure as described in Engineering Controls. Do not expose cylinders to temperatures higher than about 50 C. Some small cylinders, such as lecture bottles and cylinders of highly toxic gases, are not fitted with rupture devices and may explode if exposed to high temperatures. Never place cylinders where they may become part of an electric circuit. Avoid areas that are damp or subject to other corrosive materials. Do not store flammables and oxidizers together. Keeps cylinders in storage upright, secure, and interlocked into a compact group. Protect cylinders stored outside from standing water by providing proper drainage. Where outdoors storage is necessary, an overhead cover is necessary to avoid sunlight and rain.

8. Transporting Cylinders – Hazardous gas cylinders must be transported directly from the gas supplier to the end user storage location, unless an exhausted and approved "staging" area has been constructed. Cylinders must never be transported without valve protection caps in place. *Never move a cylinder with a regulator attached!* Cylinders larger than lecture bottle size should be chained or strapped to a wheeled cart during transport to ensure stability. Only trained personnel using approved trucks must do transportation of cylinders. Handle cylinders of compressed gases with the respect that high-energy sources deserve.
9. Shipping – Promptly remove the regulators from empty cylinders, leak test hazardous gases, and replace the protective caps at once. Mark the cylinder "MT". Never bleed a cylinder completely empty. Leave a slight pressure to keep contaminants out. Toxic, corrosive, and Pyrophoric gases must remain in their exhausted enclosures until shipped back to the supplier.
10. Changing Cylinders – Special procedures are required for changing toxic, corrosive, and Pyrophoric gases and liquids. A proper cylinder purge panel is needed for high hazard gases, along with an adequate purge procedure. Persons changing gas cylinders requiring SCBA must work with a partner who is identically equipped.
11. Changing Pump Oil – Hazardous gases may be absorbed into vacuum pump oils. Personnel performing vacuum pump oil changes on pumps used with highly toxic gases must use SCBA for pump oil change. Hot pump oil should be allowed to cool prior to c hanging.
12. Other Equipment Maintenance Considerations – Consider equipment maintenance needs in advance. Consider reaction byproducts (e.g. use proper skin and eye protection when cleaning process chambers or vacuum pumps). "Low hazard" gases such as freons will generate chlorine and fluorine decomposition products. Be sure to *LOCK OUT* upstream gas lines leading to equipment prepared for maintenance. Compressed gases are a hazardous energy source requiring lockout procedure. Be sure to adequately purge lines following lockout procedures and before beginning maintenance.
13. General Work Practices – Never use a cylinder that cannot be identified positively. Do not use compressed gas or compressed air to blow away dust or dirt (unless specifically equipped with a 30 psi or less diffuser for this application as used in machine shops). Flying dust and debris, as well as high-pressure air itself, can cause significant injury. When not in use, close cylinder valves. The main cylinder valve should be tightly closed, but needle valves should only be finger tight to avoid ruining the valve and/or valve stem.
14. Emergency Procedures – Leaking cylinders should not be removed from their exhausted enclosures. Actuate remote emergency gas shutoff valve/button, if present. (Installed highly toxic gases, if properly installed, will have flow limiting devices and/or automatic cylinder shutoff valves in place to limit and shutoff the gas supply.) Close the main cylinder valve if a leak is stopped or slow, hazardous gases are contained in their enclosure, and it is clearly safe to approach. Do not extinguish a flame involving a highly combustible gas until the source of gas has

been shut off, otherwise, it can reignite, causing an explosion. Cylinders leaking at the cylinder valve should be reported to Public Safety (this should be reported as a "none emergency" if the cylinder and gas are contained in an exhausted enclosure). If a hazardous gas is released into an unexhausted enclosure and the gas supply cannot be promptly cutoff, actuate the emergency evacuation procedure in your area and contact Public Safety. This procedure will also be initiated automatically if gas monitors trigger the building evacuation alarm. The Superfund Amendments and Re-authorization Act of 1986 (SARA Title III) states that releases of extremely hazardous substances must be reported to EPA. Accidental discharge of cylinder contents is to be promptly reported to the Site Manager and Safety coordinator. Cylinders found to be leaking upon gas delivery should not be accepted from the gas supplier.

Gases for Welding and Cutting

OSHA lists requirements for oxygen-fuel gas welding and cutting in 29 CFR 1910 .253. Cylinder handling precautions, materials of construction, and additional requirements are listed. This information should be reviewed by persons who will be using acetylene , oxygen, and other fuel gases or those who are designing facilities and equipment for this purpose. Please see the Personal Protective Equipment section of this manual for information on eye protection for welding and cutting operations. Be sure that all fuel gases are shut off at the cylinder valve after each use.

Cryogenic Liquids

All cryogenic liquids should be used with caution due to the potential for skin or eye damage due to the low temperature, and the hazards associated with pressure buildups in enclosed piping or containers. Portable containers should only be used where there is sufficient ventilation. Do not place containers in a closet or other enclosed space where there is no ventilation supply to the area. The buildup of inert gas in such an area could generate an oxygen deficient atmosphere.
A full face shield, loose fitting cryogenic handling gloves, apron, and cuff less slacks are the recommended equipment for transferring cryogenic fluids. Special vacuum jacket containers with loose fitting lids should be used to handle small quantities. Vacuum jacketed containers provided by the gas supplier will have overpressure relief devices in place. When plumbing cryogenic liquids, it is very important to include a pressure relief valve between any two-shutoff valves, and any space where cryogenic fluids may accumulate. Overpressure relief devices as well must protect against leakage into enclosed equipment. Tremendous pressures can be obtained in enclosed spaces as the liquid converts to gas. For example, one cubic centimeter of liquid nitrogen will expand to 700 times this volume as it converts (warms) to its gaseous state. Lines carrying liquid should be well insulated. Containers to be filled with cryogenic liquids should be filled slowly to avoid splashing. Cryogenic containers showing evidence of loss of vacuum in their outer jacket (ice buildup on the outside of the container) should not be accepted from the gas supplier. Contact with air (or gases with a higher boiling point) can cause

an ice plug in a cryogenic container. Should ice plugs be noted, contact the Safety department to obtain assistance.

Compressed Air Systems & Usage

Use compressed air as a cleaning method only when absolutely necessary. It involves a large number of hazards not present with other methods.

Authorized uses include:

- Paint spraying pneumatic controls
- Pneumatic tools
- Siphons

Compressed Air Usage

- Only machinery that cannot be cleaned in any other way should be cleaned by compressed air.
- Never use compressed air to clean equipment or parts which are contaminated by toxic materials.
- Compressed air used for cleaning machinery or shop areas and/or operated from a hand-held nozzle or similar device must have a nozzle pressure of less than 30 psig, if the nozzle is deadened.
- This may be accomplished by the use of a pressure-reducing valve in the air line or by the use of air guns designed to reduce or relieve nozzle air line pressure to less than 30 psig.
- Wear eye protection when you must use compressed air for cleaning. Ensure people working around you are shielded from the air blast and flying chips.

Air Receivers and Compressors

- All air receivers or tanks (this does not include compressed gas cylinders, which must not be employed as air receivers) used for the storage of l cubic foot or more of compressed air at a pressure in excess of 50 psig must be constructed in accordance with the American Society of Mechanical Engineers (ASME) Boilers and Pressure Code.
- All safety valves must be installed and maintained in accordance with the ASME code.
- Air receivers and tanks are to be installed so that all drains handholds, and personnel access openings are easily accessible, and should be supported so as to allow sufficient clearance for complete external inspection.
- Each air compressor system must be provided with a connection of the appropriate size for attaching an inspector's test gauge when the system is in service.
- Nothing must obstruct the connection of the inspector's test gauge.
- Provisions must be made for the removal of oil and water from the tanks.
- Drain valves must be located at the lowest point possible and a draining schedule established to prevent the accumulation of excessive amounts of liquid in the receiver.

- Readily visible pressure gauges must be installed.
- Spring loaded safety devices with a total relieving capacity sufficient to prevent a rise in pressure of more than l0 percent above the maximum allowable working pressure of the receiver must also be installed.
- At least one safety valve in each system must be set to operate at or below the maximum allowable working pressure.
- Valves must not be installed between the air receiver and any of its safety valves.
- Daily testing of controlling and safety valves is required.
- All safety appliances such as safety valves, indicating devices, and controlling devices must be constructed, located, and installed so that they cannot readily be made inoperative by any means, including weathering.
- Hoses and lines used in any compressed air system must be rated to meet the maximum operating pressure (both static and transient) of the equipment or apparatus.
- Hoses and lines should be properly assembled; incorrect fittings should be avoided.
- A system should be designed with the least number of bends and the largest diameter feasible.
- Additionally, hoses and lines should be protected from external damage, e.g., heat, abrasion and corrosion. To this end, they should not be placed where they can be trod on, tripped over, or driven over by personnel or equipment.
- Vent pressure relief valves and rupture discs to a safe area, where personnel will not be affected, e.g. toward a wall.

Policy Number: SP220
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Confined Space Policy

Purpose:

To ensure that employees are made aware of what is considered a confined space and to present the associated hazards.

Applicability:

All employees

Procedure:

Confined space: A space that is large enough or so configured that an employee can bodily enter and perform work, and has limited or restricted means for entry or exit (i.e. tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry). This space is not designed for continuous employee occupancy.

Permit required Confined Space (permit space): A confined space that has one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere.
2. Contains a material that has the potential for engulfing an entrant.
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly covering walls or by a floor that slopes downward and tapers to a smaller cross-section.
4. Contains any other recognized serious safety or health hazard.

Each Permit-Required Confined Space will be marked "Confined Space - Entry Permit Required".

It is the policy of Triangle Services that no employee will enter a permit required confined space during the course of routine assigned tasks. If a non-routine task mandates that an employee enter a permit required confined space, or any space that meets the above definition for a confined space, the Director of Safety must be contacted and a Job Hazard Analysis must be completed by the on-site management team. No employee shall be allowed to enter a space that meets the definition of a confined space until the Job Hazard Analysis has been approved for use by the Director of Safety.

Entry to a permit required confined space is regulated by 29 CFR 1910.146

Policy Number: SP230
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Excavation

Purpose:

Define excavation and establish limits of permissible activity in regards to excavation.

Applicability:

All employees

Policy:

Definition: "Excavation" means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

It is the policy of Triangle Services that no employee will perform excavation during the course of routine assigned tasks. If a non-routine task mandates that an employee perform excavation, the Director of Safety must be contacted and a Job Hazard Analysis must be completed by the on-site management team. No employee shall be allowed to excavate until the Job Hazard Analysis and a written procedure that identifies the competent person and all other personnel involved has been approved for use by the Director of Safety.

Excavation is regulated by OSHA standard 29 CFR 1926 Subpart P

Policy Number: SP240
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Hearing Conservation

Purpose:

Conservation of hearing is achieved through preventative measures. To reduce occupational hearing loss, all employees, who work in potentially noisy areas, are provided hearing protection, training and annual hearing tests. OSHA's hearing conservation standard is covered in 29 CFR 1910.95. Engineering controls are applied to reduce noise from equipment and operations.

Applicability:

All employees

Procedure:

Responsibilities

Management

- Use Engineering and Administrative controls to limit employee exposure
- Provide adequate hearing protection for employees
- Post signs and warnings for all high noise areas
- Conduct noise surveys annually or when new equipment is added
- Conduct annual hearing tests for all employees, if levels are specified above normal limits using noise level table; 29 CFR 1910.95 Permissible Noise level Exposures.
- Conduct hearing conservation training for all new employees
- Conduct annual hearing conservation training for all employees

Employees

- Use Company provided, approved hearing protection in designated high noise areas.
- Request new hearing protection when needed.
- Exercise proper care of issued hearing protection

Training

At time of hire and annually thereafter, all affected Employees must attend Hearing Conservation Training. The initial training is conducted as part of the New Hire Orientation Program by the Site Manager or delegated employee, and consists of:

1. Rules and procedures.
2. Where hearing protection is required.
3. How to use and care for hearing protectors.
4. How noise affects hearing and hearing loss.

Engineering Controls

After it is determined that noise exposure above 85 dB(A) are present, engineering controls should be evaluated and implemented to reduce the noise exposure before administrative controls are initiated. Some examples of engineering controls include:

1. Noise reducing baffles
2. Compartmentalization
3. Installing noise reducing gears
4. Installing rubber pads under machinery

When new equipment or machinery is evaluated for purchase, the Safety Coordinator should be consulted to conduct an evaluation from a safety and health standpoint. One criteria of the evaluation should include the amount of noise the equipment will produce and how it will affect the overall noise exposure.

Administrative Controls

After engineering controls are evaluated for effectiveness or feasibility, administrative controls should be considered to reduce noise exposure. Administrative controls include restricting exposure time or using personal protective equipment (PPE).
Personal Protective Equipment, such as earplugs or muffs, may be used to reduce the amount of noise exposure. Each plug or muff has a noise reductions factor (NR) as evaluated by ANSI Standards (S3.19 - 1974 or Z24.22 - 1957). For example, if a work area has an ambient noise exposure of 96 dB(A), the hearing protectors should be rated 6 NR or better to be effective.

According to OSHA Regulations, each location with noise exposures of 85 to 89 dB(A) will provide hearing protectors for the Employee's optional use. Noise exposures at 90 dB(A) or above require the mandatory use of hearing protection. Further, OSHA requires that a variety of hearing protectors be available for Employees to choose (both a variety of plug and muff type hearing protectors).

Types of Hearing Protectors

Hearing protection devices are the first line of defense against noise in environments where engineering controls have not reduced employee exposure to safe levels. Hearing protective devices can prevent significant hearing loss, but only if they are used properly. The most popular hearing protection devices are earplugs, which are inserted into the ear canal to provide a seal against the canal walls. Earmuffs enclose the entire external ears inside rigid cups. The inside of the muff cup is lined with acoustic foam and the perimeter of the cup is fitted with a cushion that seals against the head around the ear by the force of the headband.

Use of Hearing Protectors

Management, Supervision and Employees shall properly wear the prescribed hearing protectors while working in or traveling through any section of a Location that is designated a High Noise Area. (Excluding, offices, break rooms, and rest facilities). The following rules will be enforced:

- Personal stereos, such as Walkmans, etc., will not be permitted in any operating area of company property.
- Hearing protectors, at least two types of plugs and one type of muffs, will be provided and maintained by Company
- Hearing protectors and replacements will be provided free of charge
- Hearing protectors will be properly worn at all times, except in offices, break rooms, rest facilities.

Preformed earplugs and earmuffs should be washed periodically and stored in a clean area, and foam inserts should be discarded after each use. It is important to wash hands before handling pre-formed earplugs and foam inserts to prevent contaminants from being placed in the ear, which may increase your risk of developing infections.

Policy Number: SP250
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Forklift Safety

Purpose:

Material handling is a significant safety concern. During the movement of products and materials there are numerous opportunities for personal injury and property damage if proper procedures and caution are not used. This chapter applies to all powered industrial trucks, hoists & lifting gear. The information in this chapter shall be used to train prospective industrial truck operators and provide the basis for refresher and annual retraining. OSHA reference for Powered Industrial Trucks is 29 CFR1910 178.

Applicability:

All Employees

Procedure:

Responsibilities

Management

- Provide adequate training in safe operation of all equipment used to move or access materials
- Provide equipment that is safe to operate
- Implement an "Out of Service" program for damaged equipment
- Not allow modification to equipment except those authorized in writing by the equipment manufacturer
- Establish safe operating rules and procedures

Supervisors

- Monitor safe operations of material handling equipment
- Ensure all equipment is safety checked daily

- Tag "Out of Service" any damaged equipment

Employees

- Operate only that equipment for which they have been specifically trained and authorized
- Conduct required daily pre-use inspections
- Report any equipment damage of missing safety gear
- Follow all safety rules and operating procedures

Hazards

- Falling loads
- Overloading of equipment
- Impact with equipment
- Piercing of containers
- Loading dock roll off
- Chemical contact - battery acid
- Fires during refueling

Hazard Controls

- Control of equipment keys
- Authorized fueling & recharge areas
- Proper palletizing of material
- Marked travel lanes
- Equipment warning lights
- Seat belts
- Mounted fire extinguishers

Pre-Qualification

All candidates for Powered Industrial Truck (PIT) operators must meet the following basic requirements prior to starting initial or annual refresher training:

- Must have no adverse vision problems that cannot be corrected by glasses or contacts
- No adverse hearing loss that cannot be corrected with hearing aids
- No physical impairments that would impair safe operation of the PIT
- No neurological disorders that affect balance or consciousness

- Not taking any medication that affects perception, vision, or physical abilities

Training

Trainer:

An experienced operator, that has completed a "train-the-trainer" course and holds a current certification from a third party trainer, shall conduct training for Powered Industrial Truck (PIT) Operators.

Training:

Powered industrial truck operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace:

Truck-related topics:

- Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;
- Differences between the truck and the automobile;
- Truck controls and instrumentation: where they are located, what they do, and how they work;
- Engine or motor operation;
- Steering and maneuvering;
- Visibility (including restrictions due to loading);
- Fork and attachment adaptation, operation, and use limitations;
- Vehicle capacity;
- Vehicle stability;
- Any vehicle inspection and maintenance that the operator will be required to perform;
- Refueling and/or charging and recharging of batteries;
- Operating limitations;
- Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

Workplace-related topics:

- Surface conditions where the vehicle will be operated;
- Composition of loads to be carried and load stability;
- Load manipulation, stacking, and unstacking;
- Pedestrian traffic in areas where the vehicle will be operated;
- Narrow aisles and other restricted places where the vehicle will be operated;
- Hazardous (classified) locations where the vehicle will be operated;

- Ramps and other sloped surfaces that could affect the vehicle's stability;
- Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;
- Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

All operational training shall be conducted under close supervision. All training and evaluation must be completed before an operator is permitted to use a Powered Industrial Truck (forklift, etc) without continual & close supervision.

Refresher Training and Evaluation.

Refresher training, including an evaluation of the effectiveness of that training shall be conducted to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely. Refresher training in relevant topics shall be provided to the operator when:

1. The operator has been observed to operate the vehicle in an unsafe manner
2. The operator has been involved in an accident or near-miss incident
3. The operator has received an evaluation that reveals that the operator is not operating the truck safely
4. The operator is assigned to drive a different type of truck
5. A condition in the workplace changes in a manner that could affect safe operation of the truck
6. Once every 3 years an evaluation will be conducted of each powered industrial truck operator's performance.

Safe Operating Procedures (SOP) & Rules

- Only authorized and trained personnel will operate PIT's.
- All PIT's will be equipped with a headache rack, fire extinguisher, rotating beacon, back-up alarm and seat belts. Seat belts will be worn at all times by the Operator.
- The operator will perform daily pre- and post-trip inspections.
- Any Safety defects (such as hydraulic fluid leaks; defective brakes, steering, lights, or horn; and/or missing fire extinguisher, lights, seat belt, or back-up alarm) will be reported for immediate repair or have the PIT taken "Out of Service".

- Operators will follow the proper recharging or refueling safety procedures.

- Loads will be tilted back and carried no more than 6 inches from the ground. Loads that restrict the operator's vision will be transported backwards.

- PITs will travel no faster than 5 mph or faster than a normal walk.

- Hard hats will be worn by PIT Operators in high lift areas. .

- Operator will sound horn and use extreme caution when meeting pedestrians, making turns and cornering.

- Passengers may not ride on any portion of a PIT. Only the operator will ride PITs. "NO PASSENGERS" decals will be affixed on all PITs.

- If PITs are used as a man lift, an appropriate man lift platform (cage with standard rails and toe-boards) will be used.

- Aisle will be maintained free from obstructions, marked and wide enough (six foot minimum) for vehicle operation.

- Lift capacity will be marked on all PITs. Operator will assure load does not exceed rated weight limits.

- When un-attended, PITs will be turned off, forks lowered to the ground and parking brake applied.

- All PIT's (with exception of pallet jacks) will be equipped with a multi-purpose dry chemical fire extinguisher. (Minimum rating; 2A:10B:C)

- Operators are instructed to report all accidents, regardless of fault and severity, to Management. Management will conduct an accident investigation.

- When loading rail cars and trailers, dock plates will be used. Operators will assure dock plates are in good condition and will store on edge when not in use.
- Rail cars and trailers will be parked squarely to the loading area and have wheels chocked in place. Operators will follow established Docking/Un-Docking Procedures.

Changing and Charging Storage Batteries

- Battery charging installations shall be located in areas designated for that purpose.
- Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.
- A conveyor, overhead hoist, or equivalent material handling equipment shall be provided for handling batteries.
- Reinstalled batteries shall be properly positioned and secured in the truck.
- A carboy tilter or siphon shall be provided for handling electrolyte.
- When charging batteries, acid shall be poured into water; water shall not be poured into acid.
- Trucks shall be properly positioned and brake applied before attempting to change or charge batteries.
- Care shall be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat.
- Smoking is prohibited in the charging area.
- Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.
- Tools and other metallic objects shall be kept away from the top of uncovered batteries.

Operations

- If at any time a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, the truck shall be taken out of service until it has been restored to safe operating condition.
- Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.
- No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.

- Unauthorized personnel shall not be permitted to ride on powered industrial trucks.

- Arms or Legs shall not be placed between the uprights of the mast or outside the running lines of the truck.

- When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the truck is parked on an incline.

- A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car. Trucks shall not be used for opening or closing freight doors.

- There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.

- An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.

- A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.

- Trucks shall not be parked so as to block fire aisles, access to stairways, or fire equipment.

Traveling

- All traffic regulations shall be observed, including authorized speed limits. A safe distance shall be maintained approximately three truck lengths from the truck ahead, and the truck shall be kept under control at all times.

- The right of way shall be yielded to ambulances, fire trucks, or other vehicles in emergency situations.

- Other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations shall not be passed.

- The driver shall be required to slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being

carried obstructs forward view, the driver shall be required to travel with the load trailing.

- Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.

- The driver shall be required to look in the direction of, and keep a clear view of the path of travel.

- Grades shall be ascended or descended slowly. When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade. On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.

- Under all travel conditions the truck shall be operated at a speed that will permit it to be brought to a stop in a safe manner.

- Stunt driving and horseplay shall not be permitted.

- The driver shall be required to slow down for wet and slippery floors.

- Dock board or bridge plates, shall be properly secured before they are driven over. Dock board or bridge plates shall be driven over carefully and slowly and their rated capacity never exceeded.

- Running over loose objects on the roadway surface shall be avoided.

- While negotiating turns, speed shall be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel shall be turned at a moderate, even rate.

Loading

- Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads that cannot be centered.

- Only loads within the rated capacity of the truck shall be handled.

- The long or high (including multiple-tiered) loads that may affect capacity shall be adjusted.

- Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.

- A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.

- Extreme care shall be used when tilting the load forward or backward, particularly when high tiering. Tilting forward with load engaging means elevated shall be prohibited except to pick up a load. An elevated load shall not be tilted forward except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load shall be used.

Fueling Safety

- Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.

- Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.

- No truck shall be operated with a leak in the fuel system until the leak has been corrected.

- Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

Policy Number: SP260
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Heat Preparedness

Purpose:

The following information has been collected from the National Institute for Occupational Safety and Health (NIOSH). The purpose of this program is to provide guidance for protecting employees from hazards of high heat conditions and to provide information on engineering, administrative and PPE controls. Being uncomfortable is not the major problem with working in high temperatures and humidity's. Workers who are suddenly exposed to working in a hot environment face additional and generally avoidable hazards to their safety and health.

Applicability:

All employees required to work in environments in excess of 82 degree farenheit

Procedure:

Responsibilities

Management:

- Provide information to workers on signs of heat stress
- Provide means of preventing heat stress and other heat related health hazards

Hazard Control

Engineering Controls

- Ensure all inside areas have adequate ventilation
- Provide shaded awnings for outside work when possible
- Provide portable ventilation when possible

Administrative Controls

- Provide training to all affected employees

- Provide adequate and sanitary drinking facilities and utensils
- Rotate workers during high heat operations

Protective Equipment

- Provide cooling PPE when appropriate

How the Body Handles Heat

The human body, being warm blooded, maintains a fairly constant internal temperature, even though it is being exposed to varying environmental temperatures. To keep internal body temperatures within safe limits, the body must get rid of its excess heat, primarily through varying the rate and amount of blood circulation through the skin and the release of fluid onto the skin by the sweat glands. These automatic responses usually occur when the temperature of the blood exceeds 98.6^{o}F and are kept in balance and controlled by the brain. In this process of lowering internal body temperature, the heart begins to pump more blood, blood vessels expand to accommodate the increased flow, and the microscopic blood vessels (capillaries) which thread through the upper layers of the skin begin to fill with blood. The blood circulates closer to the surface of the skin, and the excess heat is lost to the cooler environment.

If heat loss from increased blood circulation through the skin is not adequate, the brain continues to sense overheating and signals the sweat glands in the skin to shed large quantities of sweat onto the skin surface. Evaporation of sweat cools the skin, eliminating large quantities of heat from the body.

As environmental temperatures approach normal skin temperature, cooling of the body becomes more difficult. If air temperature is as warm as or warmer than the skin, blood brought to the body surface cannot lose its heat. Under these conditions, the heart continues to pump blood to the body surface, the sweat glands pour liquids containing electrolytes onto the surface of the skin and the evaporation of the sweat becomes the principal effective means of maintaining a constant body temperature. Sweating does not cool the body unless the moisture is removed from the skin by evaporation. Under conditions of high humidity, the evaporation of sweat from the skin is decreased and the body's efforts to maintain an acceptable body temperature may be significantly impaired. These conditions adversely affect an individual's ability to work in the hot environment. With so much blood going to the external surface of the body, relatively less goes to the active muscles, the brain, and other internal organs; strength declines; and fatigue occurs sooner than it would otherwise. Alertness and mental capacity also may be affected. Workers who must perform delicate or detailed work may find their accuracy suffering, and others may find their comprehension and retention of information lowered.

Safety Problems

Certain safety problems are common to hot environments. Heat tends to promote accidents due to the slipperiness of sweaty palms, dizziness, or the fogging of safety glasses. Wherever there exists molten metal, hot surfaces, steam, etc., the possibility of burns from accidental contact also exists.

Aside from these obvious dangers, the frequency of accidents, in general, appears to be higher in hot environments than in more moderate environmental conditions. One reason is that working in a hot environment lowers the mental alertness and physical performance of an individual. Increased body temperature and physical discomfort promote irritability, anger, and other emotional states which sometimes cause workers to overlook safety procedures or to divert attention from hazardous tasks.

Health Problems

Excessive exposure to a hot work environment can bring about a variety of heat-induced disorders.

Heat Stroke

Heat stroke is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

A heat stroke victim's skin is hot, usually dry, red or spotted. Body temperature is usually 105_F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur.

Any person with signs or symptoms of heat stroke requires immediate hospitalization. However, first aid should be immediately administered. This includes removing the victim to a cool area, thoroughly soaking the clothing with water, and vigorously fanning the body to increase cooling. Further treatment at a medical facility should be directed to the continuation of the cooling process and the monitoring of complications which often accompany the heat stroke. Early recognition and treatment of heat stroke are the only means of preventing permanent brain damage or death.

Heat Exhaustion

Heat exhaustion includes several clinical disorders having symptoms which may resemble the early symptoms of heat stroke. Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from heat exhaustion still sweats but experiences extreme weakness or fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit or lose consciousness. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature is normal or only slightly elevated.

In most cases, treatment involves having the victim rest in a cool place and drink plenty of liquids. Victims with mild cases of heat exhaustion usually recover spontaneously with

this treatment. Those with severe cases may require extended care for several days. There are no known permanent effects.

CAUTION Persons with heart problems or those on a low sodium diet who work in hot environments should consult a physician about what to do under these conditions.

Heat Cramps

Heat cramps are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. The drinking of large quantities of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly thereafter, the low salt level in the muscles causes painful cramps. The affected muscles may be part of the arms, legs, or abdomen, but tired muscles (those used in performing the work) are usually the ones most susceptible to cramps. Cramps may occur during or after work hours and may be relieved by taking salted liquids by mouth.

CAUTION: Persons with heart problems or those on a low sodium diet who work in hot environments should consult a physician about what to do under these conditions.

Fainting

A worker who is not accustomed to hot environments and who stands erect and immobile in the heat may faint. With enlarged blood vessels in the skin and in the lower part of the body due to the body's attempts to control internal temperature, blood may pool there rather than return to the heart to be pumped to the brain. Upon lying down, the worker should soon recover. By moving around, and thereby preventing blood from pooling, the patient can prevent further fainting. Heat rash, also known as prickly heat, is likely to occur in hot, humid environments where sweat is not easily removed from the surface of the skin by evaporation and the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears. When the rash is extensive or when it is complicated by infection, prickly heat can be very uncomfortable and may reduce a worker's performance. The worker can prevent this condition by resting in a cool place part of each day and by regularly bathing and drying the skin.

Transient Heat Fatigue

Transient heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Workers unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance. The severity of transient heat fatigue will be lessened by a period of gradual adjustment to the hot environment (heat acclimatization).

Preparing for the Heat

One of the best ways to reduce heat stress on workers is to minimize heat in the workplace. However, there are some work environments where heat production is difficult to control, such as when furnaces or sources of steam or water are present in the work area or when the workplace itself is outdoors and exposed to varying warm weather conditions.

Humans are, to a large extent, capable of adjusting to the heat. This adjustment to heat, under normal circumstances, usually takes about 5 to 7 days, during which time the body will undergo a series of changes that will make continued exposure to heat more endurable.

On the first day of work in a hot environment, the body temperature, pulse rate, and general discomfort will be higher. With each succeeding daily exposure, all of these responses will gradually decrease, while the sweat rate will increase. When the body becomes acclimated to the heat, the worker will find it possible to perform work with less strain and distress.

Gradual exposure to heat gives the body time to become accustomed to higher environmental temperatures. Heat disorders in general are more likely to occur among workers who have not been given time to adjust to working in the heat or among workers who have been away from hot environments and who have gotten accustomed to lower temperatures. Hot weather conditions of the summer are likely to affect the worker who is not acclimatized to heat. Likewise, the heat in the work environment may affect workers who return to work after a leisurely vacation or extended illness. Whenever such circumstances occur, the worker should be gradually reacclimatized to the hot environment.

Lessening Stressful Conditions

Many industries have attempted to reduce the hazards of heat stress by introducing engineering controls, training workers in the recognition and prevention of heat stress, and implementing work-rest cycles. Heat stress depends, in part; on the amount of heat the worker's body produces while a job is being performed. The amount of heat produced during hard, steady work is much higher than that produced during intermittent or light work. Therefore, one way of reducing the potential for heat stress is to make the job easier or lessen its duration by providing adequate rest time. Mechanization of work procedures can often make it possible to isolate workers from the heat sources (perhaps in an air-conditioned booth) and increase overall productivity by decreasing the time needed for rest. Another approach to reducing the level of heat stress is the use of engineering controls that include ventilation and heat shielding.

Number and Duration of Exposures

Rather than be exposed to heat for extended periods of time during the course of a job, workers should, wherever possible, be permitted to distribute the workload evenly over the day and incorporate work-rest cycles. Work-rest cycles give the body an opportunity to get rid of excess heat, slow down the production of internal body heat, and provide greater blood flow to the skin.

Workers employed outdoors are especially subject to weather changes. A hot spell or a rise in humidity can create overly stressful conditions. The following practices can help to reduce heat stress:

- Postponement of nonessential tasks
- Permit only those workers acclimatized to heat to perform the more strenuous tasks
- Provide additional workers to perform the tasks keeping in mind that all workers should have the physical capacity to perform the task and that they should be accustomed to the heat.

Thermal Conditions in the Workplace

A variety of engineering controls can be introduced to minimize exposure to heat. For instance, improving the insulation on a furnace wall can reduce its surface temperature and the temperature of the area around it. In a laundry room, exhaust hoods installed over those sources releasing moisture will lower the humidity in the work area. In general, the simplest and least expensive methods of reducing heat and humidity can be accomplished by:

- Opening windows in hot work areas
- Using fans
- Using other methods of creating airflow such as exhaust ventilation or air blowers.

Rest Areas

Providing cool rest areas in hot work environments considerably reduces the stress of working in those environments. There is no conclusive information available on the ideal temperature for a rest area. However, a rest area with a temperature near 76 degrees F appears to be adequate and may even feel chilly to a hot, sweating worker, until acclimated to the cooler environment. The rest area should be as close to the workplace as possible. Individual work periods should not be lengthened in favor of prolonged rest periods. Shorter but frequent work-rest cycles are the greatest benefit to the worker.

Drinking Water

In the course of a day's work in the heat, a worker may produce as much as 2 to 3 gallons of sweat. Because so many heat disorders involve excessive dehydration of the body, it is essential that water intake during the workday be about equal to the amount of sweat produced. Most workers exposed to hot conditions drink less fluid than needed because of an insufficient thirst drive. A worker, therefore, should not depend on thirst to signal when and how much to drink. Instead, the worker should drink 5 to 7 ounces of fluids every 15 to 20 minutes to replenish the necessary fluids in the body. There is no optimum temperature of drinking water, but most people tend not to drink warm or very cold fluids as readily as they will cool ones. Whatever the temperature of the water, it must be palatable and readily available to the worker. Individual drinking cups should be provided----never use a common drinking cup.

Heat acclimatized workers lose much less salt in their sweat than do workers who are not adjusted to the heat. The average American diet contains sufficient salt for acclimatized workers even when sweat production is high. If, for some reason, salt replacement is required, the best way to compensate for the loss is to add a little extra salt to the food. Salt tablets should not be used.

CAUTION Persons with heart problems or those on a low sodium diet who work in hot environments should consult a physician about what to do under these conditions.

Protective Clothing.

Clothing inhibits the transfer of heat between the body and the surrounding environment. Therefore, in hot jobs where the air temperature is lower than skin temperature, wearing clothing reduces the body's ability to lose heat into the air.

When air temperature is higher than skin temperature, clothing helps to prevent the transfer of heat from the air to the body. However, this advantage may be nullified if the clothes interfere with the evaporation of sweat.

In dry climates, adequate evaporation of sweat is seldom a problem. In a dry work environment with very high air temperatures, protective clothing could be an advantage to the worker. The proper type of clothing depends on the specific circumstance. Certain work in hot environments may require insulated gloves, insulated suits, reflective clothing, or infrared reflecting face shields. For extremely hot conditions, thermally-conditioned clothing is available. One such garment carries a self-contained air conditioner in a backpack, while another is connected to a compressed air source which feeds cool air into the jacket or coveralls through a vortex tube. Another type of garment is a plastic jacket that has pockets, which can be filled with dry ice or containers of ice.

Employee Awareness

The key to preventing excessive heat stress is educating the employer and worker on the hazards of working in heat and the benefits of implementing proper controls and work practices. The employer should establish a program designed to acclimatize workers who must be exposed to hot environments and provide necessary work-rest cycles and water to minimize heat stress.

Special Considerations

During unusually hot weather conditions lasting longer than 2 days, the number of heat illnesses usually increases. This is due to several factors, such as progressive body fluid deficit, loss of appetite (possible salt deficit), buildup of heat in living and work areas, and breakdown of air-conditioning equipment. Therefore, it is advisable to make a special effort to adhere rigorously to the above preventive measures during these extended hot spells and to avoid any unnecessary or unusual stressful activity. Sufficient sleep and good nutrition are important for maintaining a high level of heat tolerance. Workers who may be at a greater risk of heat illnesses are the obese, the chronically ill, and older individuals.

When feasible, the most stressful tasks should be performed during the cooler parts of the day (early morning or at night). Double shifts and overtime should be avoided whenever possible. Rest periods should be extended to alleviate the increase in the body heat load.

The consumption of alcoholic beverages during prolonged periods of heat can cause additional dehydration. Persons taking certain medications (e.g., medications for blood pressure control, diuretics, or water pills) should consult their physicians in order to determine if any side effects could occur during excessive heat exposure. Daily fluid intake must be sufficient to prevent significant weight loss during the workday and over the workweek.

Policy Number: SP270
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Cold Weather Safety

Purpose:

Very cold temperatures, like very hot ones, can be hazardous to your health. Proper dress and some sensible practices can prevent a lot of the problems associated with cold weather. This policy has been developed to help employees understand the hazards associated with working in cold climates, and the steps required to prevent injury or illness caused by the cold.

Applicability:

All employees that work in cold environments

Procedure:

General Hazards

Frostbite

The most common hazard in the cold is frostbite. Your body doesn't get enough heat and the body tissues freeze. Body parts most often affected by frostbite are the nose, ears, cheeks, fingers, and toes.

In very bad cases, frostbite can cause permanent tissue damage and loss of movement in the affected body parts. In the worst cases, you could become unconscious and stop breathing. You could even die of heart failure.

Hypothermia

Hypothermia is a condition in which core temperature drops below that required for normal metabolism and body functions which is defined as 35.0 °C (95.0 °F). Body temperature is usually maintained near a constant level of 36.5–37.5 °C (98–100 °F) through biologic homeostasis or thermoregulation. If exposed to cold and the internal mechanisms are unable to replenish the heat that is being lost a drop in core temperature occurs. As body temperature decreases characteristic symptoms occur such as shivering and mental confusion.

With both cold hazards, you're more at risk if you're older, overweight, or have allergies or poor circulation. Other factors that raise the risk are smoking, drinking, and taking medications such as sedatives.

IDENTIFYING HAZARDS

It is very important to know the symptoms of frostbite and hypothermia so that you can do something before it is too late.

Frostbite can occur from being in a cold area or from touching an object whose temperature is below freezing. In many cases, people don't have any idea that it's happening. That's why you have to be familiar with the symptoms.

Frostbite victims usually start by feeling uncomfortably cold, then numb. Sometimes they also get a tingling or aching feeling or a brief pain. The recommended practice is whenever you feel numbness, take action!

Hypothermia can also take you by surprise because you can get it even when the temperature is above freezing. Windy conditions, physical exhaustion, and wet clothing can all make you prone to hypothermia.

With hypothermia, you first feel cold, then pain in the extremities. You'll shiver, which is how the body tries to raise the temperature.

Other symptoms include numbness, stiffness (especially in the neck, arms, and legs), poor coordination, drowsiness, slow or irregular breathing and heart rate, slurred speech, cool skin, and puffiness in the face.

As you can see, many of these symptoms are not unusual and could mean different things. But if you're exposed to very cold conditions, take them seriously and take steps to relieve them.

PROTECTION AGAINST HAZARDS

The best way to deal with cold problems is to prevent them in the first place. The most sensible approach is to limit exposure to cold, especially if it's windy or damp.

If you know you're going to be in cold conditions, don't bathe, smoke, or drink, alcohol just before going out.

- **Dress for conditions in layers of loose, dry clothes**. The most effective mix is cotton or wool underneath, with something waterproof on top.

- **Get dried or changed immediately if your clothes do get wet**.

- **Be sure to cover hands, feet, face, and head**. A hat is critical because you can lose up to 40 percent of your body heat if your head isn't covered.

- **Keep moving when you're in the cold**.

- **Take regular breaks in warm area**. Go where it's warm any time you start to feel very cold or numb. Drink something warm, as long as it doesn't contain alcohol or caffeine.

SAFETY PRECAUTIONS

As you know, prevention doesn't always work. So it's important to know what to do if you or someone you're with shows symptoms of cold problems.

The first thing to do is to get where it's warm. Get out of any frozen, wet, or tight clothing and into warm clothes or blankets. Drink something warm, decaffeinated, and non-alcoholic.

For hypothermia, call 911 for medical help and keep the person covered with blankets or something similar. Don't use hot baths, electric blankets, or hot water bottles. Give artificial respiration if necessary and try to keep the person awake and dry.

For frostbite, first be aware of the don'ts:

Don't rub the body part, or apply a heat lamp or hot water bottle.

Don't go near a heater or hot stove.

Don't break any blisters.

Don't drink caffeine.

Do warm the frozen body part quickly with sheets and blankets or warm (not hot) water.

Once the body part is warm, exercise it-with one exception: Don't walk on frostbitten feet.

It’s dangerous to underestimate the health hazards you’re exposed to in the cold. But if you take some precautions before you’re exposed and know what symptoms can spell trouble, you substantially reduce your risk.

Policy Number: SP280
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Hot Work Safety

Purpose:

Welding and Hot Work, such as brazing or grinding presents a significant opportunity for fire and injury. Company employees or contractors must apply all precautions of this program prior to commencing any welding or hot work. Reference: OSHA 29 CFR 1910.252

Applicability:

All employees required to perform task utilizing or producing flames, sparks or heat. Examples would be welding, cutting with a torch, grinding, brazing, soldering…..

Procedure:

Responsibilities

Management

- Provide training for all employees whose tasks include heat, spark or flame producing operations such as welding, brazing, or grinding.
- Develop and monitor effective hot work procedures
- Provide safe equipment for hot work
- Provide proper and effective PPE for all hot work

Supervisors

- Monitor all hot work operations
- Ensure all hot work equipment and PPE are in safe working order
- Allow only trained and authorized employees to conduct hot work
- Ensure permits are used for all hot work outside authorized areas

Employees

- Follow all hot work procedures
- Properly use appropriate hot work PPE
- Inspect all hot work equipment before use
- Report any equipment problems
- Not use damaged hot work equipment

Definitions

Welding/Hot Works Procedures: any activity which results in sparks, fire, molten slag, or hot material which has the potential to cause fires or explosions.

Examples of Hot Works: Cutting, Brazing, Soldering, Thawing Pipes, Torch Applied Roofing, Grinding and Welding.

Special Hazard Occupancies: Any area containing Flammable Liquids, Dust Accumulation, Gases, Plastics, Rubber and Paper Products.

Hazards

- Fires & Explosions
- Skin burns
- Welding "blindness"
- Respiratory hazards from fumes & smoke

Training

Training shall include:

- Review of requirements listed in OSHA 1910.252
- Use of Hot Works Permit System
- Supervisor Responsibilities
- Fire Watch Responsibilities - specifically, the fire watch must know:
    1. That their ONLY duty is Fire Watch
    2. When they can terminate the watch
    3. How to use the provided fire extinguisher
    4. How to activate fire alarm if fire is beyond the incipient stage
- Operator Responsibilities
- Contractors Responsibilities

- Documentation requirements
- Respirator Usage requirements
- Fire Extinguisher training

Hot Works Procedures

All employees that perform Electrical/Mechanical tasks at any FedEx facility are required to complete the FM Global Hot Work Permit training course, and follow all elements of this program while conducting hot work

OSHA 29 CFR 1910.252 required fire prevention actions for welding/hot works.
Where practicable all combustibles shall be relocated at least 35 feet from the work site. Where relocation is impractical, combustibles shall be protected with flameproof covers, shielded with metal, guards, curtains, or wet down material to help prevent ignition of material. Ducts, conveyor systems, and augers that might carry sparks to distant combustibles shall be protected or shut down. Where cutting or welding is done near walls, partitions, ceilings, or a roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.

If welding is to be done on a metal wall, partition, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation of heat. Where combustibles cannot be relocated on the opposite side of the work, a fire watch person shall be provided on the opposite side of the work.

Welding shall not be attempted on a metal partition, wall, ceiling or roof having a covering nor on walls having combustible sandwich panel construction. Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by combustion. Cutting or welding shall not be permitted in the following situations:

- In areas not authorized by management.
- In sprinkled buildings while such protection is impaired.
- In the presence of potentially explosive atmospheres, e.g.. a flammable liquid
- In areas near the storage of large quantities of exposed, readily ignitable materials.
- In areas where there is dust accumulation of greater than 1/16 inch within 35 feet of the area where welding/hot works will be conducted. All dust accumulation should be cleaned up following the housekeeping program of the facility before welding/hot works are permitted.

Suitable extinguishers shall be provided and maintained ready for instant use.

A fire watch person shall be provided during and for 2 hours past the completion of the welding project.

A cutting/welding permit will be issued on all welding or cutting outside of the designated welding area.

Welding & Hot Work fire prevention measures

A designated welding area should be established to meet the following requirements:

- Floors swept and clean of combustibles within 35 ft. of work area.
- Flammable and combustible liquids and material will be kept 35 ft. from work area.
- Adequate ventilation providing 20 air changes per hour, such as a suction hood system should be provided to the work area.
- At least one 10 lb. dry chemical fire extinguisher should be within access of the 35 ft. of work area.

Requirements for welding conducted outside the designated welding area:

- Portable welding curtains or shields must be used to protect other workers in the welding area.
- A hot works permit must be completed and complied with prior to welding operation.
- Respiratory protection is mandatory unless an adequate monitored air flow away from the welder and others present can be established and maintained.
- Plastic materials be covered with welding tarps during welding procedures
- Fire Watch must be provided for all hot work operations.

Welding Standard Operating Procedures

The following pages list the Welding Standard Operating Procedures (SOP) and are applicable for all electric and gas welding. These SOPs are to be posted at each Designated Welding & Hot Work Area for quick reference and review.

<u>SOP - Electric Welding</u>

1. Perform Safety Check on all equipment
2. Ensure fire extinguisher is charged and available

3. Ensure electrical cord, electrode holder and cables are free from defects (no cable splices are allowed with in 10 feet of the electrode holder.
4. Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.
5. Ensure the welding unit is properly grounded.
6. All defective equipment must be repaired or replaced before use.
7. Remove flammables and combustibles
8. No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.
9. Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation)
10. Ensure Adequate Ventilation and Lighting
11. Execute Hot Work Permit procedures
12. Set Voltage Regulator
13. No higher than the following for:
    - Manual Alternating Current Welders - 80 volts
    - Automatic Alternating Current Welders - 100 volts
    - Manual or automatic Direct Current Welders - 100 volts
14. Uncoil and spread out welding cable
15. To avoid overheating, ensure proper contact of work leads and connections, remove any metal fragments from magnetic work clamps (to avoid electric shock do not wrap welding cables around a body part and avoid welding in wet conditions)
16. Fire watch for one hour after welding & until all welds have cooled
17. Perform final fire watch and terminate permit.

SOP: Gas Welding

1. Perform Safety Check on all equipment
    - Ensure tanks have gas and fittings are tight
    - Ensure fire extinguisher is charged and available
    - Ensure hoses have no defects

- Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.
- All defective equipment must be repaired or replace before uses.

2. Remove flammables and combustibles

    - No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.
    - Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation)
3. Ensure Adequate Ventilation and Lighting
4. Execute Hot Work Permit procedures
5. Open Valves on Oxygen and Gas tanks to desired flow
6. Shut Tank Valves & relieve hose pressure. Store hoses
7. Fire watch for one hour after welding & until all welds have cooled
8. Perform final fire watch and terminate permit.

Policy Number: SP290
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Housekeeping

Purpose:

Attention to general cleanliness, storage and housekeeping can prevent numerous accidents. This chapter covers items not discussed in other areas and is not intended to cover all specific housekeeping requirements. Good housekeeping efforts are a part of the company fire prevention and accident prevention program.

Applicability:

All Employees share the responsibility for maintaining good housekeeping practice and following the established housekeeping procedures. The Manager, Supervisors, Safety Coordinator and Safety Committee will be responsible to monitor housekeeping as part of their facility safety inspection procedures, note any hazards or areas of non-compliance, initiate clean-up procedures and provide follow-up. Management has the additional responsibility to provide disciplinary action when necessary to reinforce compliance with this program.

Procedure:

Hazards

Improper housekeeping and material storage can create or hide numerous hazards such as:

- Slip & trip hazards
- Chemical exposure
- Contact with sharp objects
- Fire & Explosion hazards
- Over loading of storage shelves and bins

Hazard Control

Offices

Office areas are to be kept neat and orderly. The following general rules apply to prevent injuries and maintain a professional appearance.

1. All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet of either side) of material storage (temporary and permanent) at all times.

2. Storage areas will be maintained orderly at all times. When supplies are received, the supplies will be stored properly.

3. Spills will be cleaned-up immediately and wastes disposed of properly.

4. All waste receptacles will be lined with a plastic trash bag to avoid direct contact while handling. Custodial Employees will use rubber gloves and compaction bar when handling wastes.

5. Keep file and desk drawers closed when not attended to avoid injuries. Open only one drawer at a time to prevent tipping of file cabinets.

6. At the end of the business day, turn off all office equipment (area heaters, lamps, coffee-maker, PCs, etc.) and lights to save energy and prevent fires. All space heaters should be un-plugged at the end of the day to assure they have been turned-off.

Production Areas

Production areas will be kept neat and orderly, during operations and as follows:

1. All aisles, emergency exits, fire extinguishers, eye wash stations, etc., will be kept clear (a minimum of three feet in front of and to either side) of product storage, material storage, fork trucks and pallet jacks at all times.

2. Spills will be cleaned up immediately.

3. All process leaks will be reported to supervision and maintenance for immediate repair and clean up.

4. Utility Employees will be responsible to keep aisles and work floors clear of excessive debris and waste materials during shift operation, between breaks and at shift change when necessary or directed by supervision; however, all Employees are responsible to communicate slippery floors to supervision for immediate clean-up.

5. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Rest Rooms, Locker Rooms and Cafeteria

Rest rooms, locker rooms and cafeteria are provided as a convenience for all Employees. The following rules will apply:

1. Employees are expected to clean up after themselves as a common courtesy to fellow Employees.

2. Flammable materials (fire works, explosives, gasoline, etc.) may not stored in lockers or brought on company property.

3. Personal food item will not be stored in lockers or cafeteria overnight.

4. All waste receptacles will be lined with a plastic trash bag to avoid direct contact while handling and Custodial Employees will use rubber gloves and compaction bar when handling wastes.

5. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Maintenance Areas

1. All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet of either side) of material storage (temporary and permanent) at all times.

2. Storage Areas will be maintained orderly at all times:

    a Pipe stock stored horizontally on racks and sorted by size

    b Metal stock stored horizontally on racks and sorted by size

    c Sheet metal stock stored vertically in racks and sorted by type

    d All fittings, etc., stored in bins on shelves and sorted by type and use

    e All flammables stored in OSHA-approved Fire Cabinets and self-closing cans where necessary

3. Spills will be cleaned-up immediately by the person responsible and wastes disposed properly.

4. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Grounds

The grounds surrounding the client facility are an extension of the work place. Grounds that are kept neat and orderly show pride by the company for employees, customers and neighbors to enjoy.

The following general rules will apply:

1. All trash will be discarded only in the waste containers provided.
2. Park only in the designated assigned area.
3. The Maintenance Department will be responsible for grounds keeping (mowing, trimming, etc.) as needed. Maintenance will also establish procedures for ice/snow removal, when necessary, prior to operations each day.

Smoking Policy

Smoking is not permitted inside buildings and/or within 50 feet of material storage. This includes all offices, rest rooms, locker rooms, production floor, storage areas, coolers, etc. Smoking is permitted outside in designated areas and in the Smoking Section of authorized break areas before work, after work and during breaks. To prevent fires and keep the grounds neat and orderly, all cigarette/cigar ashes and butts are to be disposed in the provided butt cans or ashtrays only.

Policy Number: SP300
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Machine Guarding and Operational Checks.

Purpose:

The Machine Guard Program is designed to protect Employees from hazards of moving machinery. All hazardous areas of a machine shall be guarded to prevent accidental "caught in" situations. References: *General Requirements for all Machines* (29 CFR 1910.212), *Woodworking Machinery* (29 CFR 1910.213), *Abrasive Wheels* (29 CFR 1910.215), *Power Presses* (29 CFR 1910.217), *Power Transmission* (29 CFR 1910.219).

Applicability:

All employees that work with or near moving machinery, equipment and tools.

Procedure:

Responsibilities

Management

- Ensure all machinery is properly guarded
- Provide training to employees on machine guard rules
- Ensure new purchased equipment meets the machine guard requirements prior to use

Supervisors

- Train assigned employees on the specific machine guard rules in their areas
- Monitor and inspect to ensure machine guards remain in place and functional
- Immediately correct machine guard deficiencies

Employees

1. Do not remove machine guards unless equipment is locked and tagged

2. Replace machine guards properly
3. Report machine guard problems to supervisors immediately
4. Do not operate equipment unless guards are in place and functional
5. Only trained and authorized employees may remove machine guards

Definition of Terms

1. Guards: Barriers that prevent Employees from contact with moving portions or parts of exposed machinery or equipment, which could cause physical harm to the Employees.

2. Enclosures: Mounted physical barriers, which prevent access to moving parts of machinery or equipment.

3. Point-of-Operation: The area on a machine or item of equipment, where work is being done, where material is positioned for processing, or changes by the machine.

4. Power Transmission: Any mechanical parts, which transmit energy and motion from a power source to the point-of-operation. Example: Gear and chain drives, cams, shafts, belt and pulley drives and rods. NOTE: Components, which are (7) feet or less from the floor or working platform shall be guarded.

5. Nip Points: In-Running Machine or equipment parts, which rotate towards each other, or where one part rotates toward stationery object.

6. Shear points: The reciprocal (back and forth) movement of a mechanical part past a fixed point on a machine.

7. Rotating Motions on exposed mechanisms are dangerous unless guarded. Even a smooth, slowly rotating shaft or coupling can grasp clothing or hair upon contact with the skin and force an arm or hand into a dangerous position. Affixed or hinged guard enclosure protects against this exposure.

8. Reciprocating: Reciprocating motion is defined as production of energy created by the back and fourth movements of certain machine or equipment parts. This motion is hazardous, when exposed, offering pinch or shear points to an Employee. A fixed enclosure such as a barrier guard is an effective method against this exposure.

9. Transverse Motions: Transverse motions are hazardous due to straight-line action and in-running nip points. Pinch and shear points also are created with exposed machinery and equipment parts operating between a fixed or other moving object. A fixed or hinged guard enclosure provides protection against this exposure.

10. Cutting Actions: Cutting action results when rotating, reciprocating, or transverse motion is imparted to a tool so that material being removed is in the form of chips. Exposed points of operation must be guarded to protect the operator from contact with cutting hazards, being caught between the operating parts and from flying particles and sparks.

11. Shearing Action: The danger of this type of action lies at the point of operation where materials are actually inserted, maintained and withdrawn. Guarding is accomplished through fixed barriers, interlocks, remote control placement (2 hand controls), feeding or ejection.

Hazards - use of machinery or equipment with inadequate guards or damaged controls can result in:

- Amputation
- Skin Burns
- Cuts & fractures
- Death

Hazard Controls - controls used to prevent exposure to moving or energized machine parts includes:

1. Machine guards
2. Interlocks
3. Presence sensing devices
4. Gates
5. Two-hand controls
6. Employee training

Machine Guarding Requirements

1. Guards shall be affixed to the machine where possible and secured.

2. A guard shall not offer an accident hazard in itself.

3. The point-of-operation of machines whose operation exposes an Employee to injury shall be guarded.

4. Revolving drums, barrels and containers shall be guarded by an enclosure which is interlocked with the drive mechanism.

5. When periphery of fan blades are less than 7 feet above the floor or working level the blades shall be guarded with a guard having openings no larger than 1/2 inch.

6. Machines designed for a fixed location shall be securely anchored to prevent walking or moving; for example, Drill Presses, and Bench Grinders, etc.

General Requirements for Machine Guards

1. Guards must prevent hands, arms or any part of an Employees body from making contact with hazardous moving parts. A good safeguarding system eliminates the possibility of the operator or other Employees from placing parts of their bodies near hazardous moving parts.

2. Employees should not be able to easily remove or tamper with guards. Guards and safety devices should be made of durable material that will withstand the conditions of normal use and must be firmly secured to the machine.

3. Guard should ensure that no objects could fall into moving parts. An example would be a small tool that is dropped into a cycling machine could easily become a projectile that could injure others.

4. Guard edges should be rolled or bolted in such a way to eliminate sharp or jagged edges.

5. Guard should not create interference that would hamper Employees from performing their assigned tasks quickly and comfortably.

6. Lubrication points and feeds should be placed outside the guarded area to eliminate the need for guard removal.

Training

All Employees shall be provided training in the hazards of machines and the importance of proper machine guards. Machine safety and machine guarding rules will be thoroughly explained as part of the new hire orientation program and annually as refresher safety training.

Operational Checks

- Operational checks are defined as inspections of equipment with the unit running, e.g. watching a conveyor belt or chain drive, listening to bearings, checking for unusual vibration, etc.
- It is the policy of Triangle Services that all operational checks will be performed with all machine safety devices, guards, panels or doors in place, and that no part of the moving equipment is touched during the check.
- If the above is not possible or practical due to machine design or unusual conditions due to Corrective Maintenance troubleshooting , the shift lead mechanic, supervisor or manager must be informed. Two mechanics will be

present for the operational check. One mechanic will perform the operational check; the other will act as a Safety Observer. The Safety Observer will be positioned at the Power/Start control, or at an E-stop in a location that gives them a clear and unobstructed view of the mechanic performing the operational check. The Safety Observer will halt the operation of the equipment in case of an emergency.

- If machine safety devices, guards, panels or doors must be removed in order to properly conduct an operational check, these item(s) must be removed/opened before the equipment is started. Never remove/open these items while equipment is running. Once equipment is running, **NEVER BREAK THE PLANE THAT WAS PROTECTED BY THE REMOVED DEVICE.**
- Employees are never permitted to come into contact with moving parts, or to break a plane normally guarded by machine guarding, doors or access panels while the equipment is running, during the performance of preventive or corrective maintenance.
- All employees that work on or near moving equipment, machinery or tools must be trained on this operational check policy and sign an acknowledgement that they understand and will abide by all policy requirements.

Policy Number: SP310
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Office Safety

Purpose:

The purpose of this program is to provide guidance to office managers and office staff on the elements of safe office work. The office is like any other work environment in that it may present potential health and safety hazards. Most of these, however, may be minimized or eliminated by designing jobs and workplaces properly, and by taking into account differences among tasks and individuals. Inadequate environmental conditions, such as noise, temperature, and humidity, may cause temporary discomforts. Environmental pollutants such as chemical vapors released from new carpeting and furniture may also induce discomforts.

Applicability:

All employees that work within an office environment

Procedure:

Responsibilities

Management

- Provide training for all office staff in:
  1. Emergency Procedures
  2. Electrical Safety
  3. Office Ergonomics
- Ensure office equipment is in safe working order
- Provide proper storage for office supplies

Office Staff

- Report all safety problems immediately
- Do not attempt to repair any office equipment or systems
- Maintain a neat and sanitary office environment

Noise Hazards

Noise can be defined very simply as unwanted sound. Whether a sound is classified as noise or not depends mostly on personal preferences. For noise levels in offices, the most common effects are interference with speech communication, annoyance, and distraction from mental activities. Noise in the office can interfere with communications. For example, it may be difficult to talk on the telephone when other people are talking nearby. Speech is likely to interfere with communications especially if the speakers have similar voices.

The annoying effect of noise can decrease performance or increase errors in some task situations. If the task requires a great deal of mental concentration, noise can be detrimental to performance. Also, there is some indication that unexpected or unpredictable noise can have more of an effect than continuous or periodic noise. The annoyance caused by noise also depends on the individual. Noise can also be distracting. A sudden noise can interrupt activity temporarily, such as when someone drops a heavy object.

Reducing Noise

Many unexpected noises cannot be controlled, as when someone accidentally drops something. For many of the annoying sounds in the office environment, the following measures are useful for reducing the level of noise or its effects:

- Select the quietest equipment if possible. When there is a choice between two or more products, sound levels should be included as a consideration for purchase and use.
- Provide proper maintenance of equipment, such as lubrication and tightening of loose parts that can cause noise.
- Locate loud equipment in areas where its effects are less detrimental. For example, place impact printers away from areas where people must use the phone.
- Use barriers, walls, or dividers to isolate noise sources. Use of buffers or acoustically treated materials can absorb noise that might otherwise travel further. Rubber pads to insulate vibrating equipment can also help to reduce noise.
- Enclose equipment, such as printers, with acoustical covers or housings.
- Schedule noisy tasks at times when it will have less of an effect on the other tasks in the office.

Electrical Safety

Electric cords should be examined on a routine basis for fraying and exposed wiring. Particular attention should be paid to connections behind furniture, since files and bookcases may be pushed tightly against electric outlets, severely bending the cord at the plug. Electrical appliances must be designed and used in accordance with UL requirements.

Use of Extension Cords

- Extension cords shall only be used in situations where fixed wiring is not feasible.
- Extension cords shall be kept in good repair, free from defects in their insulation. They will not be kinked, knotted, abraded, or cut.
- Extension cords shall be placed so they do not present a tripping or slipping hazard.
- Extension cords shall not be placed through doorways having doors that can be closed, and thereby damage the cord.
- All extension cords shall be of the grounding type (three conductor).

Housekeeping

Good housekeeping is an important element of accident prevention in offices.
Poor housekeeping may lead to fires, injuries to personnel, or unhealthful working conditions. Mishaps caused by dropping heavy cartons and other related office equipment and supplies could also be a source of serious injuries to personnel.

- Passageways in offices should be free and clear of obstructions. Proper layout, spacing, and arrangement of equipment, furniture, and machinery are essential.
- All aisles within the office should be clearly defined and kept free of obstructions.
- Chairs, files, bookcases and desks must be replaced or repaired if they become damaged. Damaged chairs can be especially hazardous. Filing cabinet drawers should always be kept closed when not in use. Heavy files should be placed in the bottom file drawers.
- Materials stored within supply rooms must be neatly stacked and readily reached by adequate aisles. Care should be taken to stack materials so they will not topple over. Under no circumstances will materials be stacked within 18 inches of ceiling fire sprinkler heads or Halon nozzles. Materials shall not be stored so that they project into aisles or passageways in a manner that could cause persons to trip or could hinder emergency evacuation.

Computer Work Stations

Complaints concerning musculoskeletal problems are frequently heard from computer operators. Most common are complaints relating to the neck, shoulders, and back. Others concern the arms and hands and occasionally the legs.

Certain common characteristics of Video Display Terminal (VDT) based jobs have been identified and associated with increased risk of musculoskeletal problems. These include:

- Design of the workstation.
- Nature of the task.
- Repetitiveness of the job.
- Degree of postural constraint.
- Work pace.
- Work/rest schedules.
- Personal attributes of individual workers.

The key to comfort is in maintaining the body in a relaxed, natural position. The ideal work position is to have the arms hanging relaxed from the shoulders. If a keyboard is used, arms should be bent at right angles at the elbow, with the hands held in a straight line with forearms and elbows close to the body. The head should be in line with the body and slightly forward.

Display Screens

When work is conducted at a computer, the top of the display screen should be at, or just slightly below, eye level. This allows the eyes to view the screen at a comfortable level, without having to tilt the head or move the back muscles.

Control glare at the source whenever possible; place VDTs so that they are parallel to direct sources of light such as windows and overhead lights, and use window treatments if necessary. When glare sources cannot be removed, seek appropriate screen treatments such as glare filters. Keep the screen clean.

Office Chair

The chair is usually the most important piece of furniture that affects user comfort in the office. The chair should be adjusted for comfort, making sure the back is supported and that the seat pan is at a height so that the thighs are horizontal and feet are flat on the floor. An ergonomically sound chair requires four degrees of freedom - seat pan tilt, backrest angle, seat height, and backrest height. Operators can then vary the chair adjustments according to the task. In general, chairs with the most easily adjustable dimensions permit the most flexibility to support people's preferred sitting postures.

Armrests on chairs are recommended for most office work except where they interfere with the task. Resting arms on armrests is a very effective way to reduce arm discomforts. Armrests should be sufficiently short and low to allow workers to get close

enough to their work surfaces, especially for tasks that require fixed arm postures above the work surface.

Working Height

The work surface height should fit the task. The principle is to place the surface height where the work may be performed in such a manner as to keep arms low and close to the body in relation to the task. If the working height is too high, the shoulders or the upper arms have to be lifted to compensate, which may lead to painful symptoms and cramps at the level of the neck and shoulders. If, on the other hand, the working height is too low, the back must be excessively bowed, which may cause backache. Generally, work should be done at about elbow height, whether sitting or standing. Adjustable workstations should be provided so that individuals may change the stations to meet their needs. A VDT workstation without an adjustable keyboard height and without an adjustable height and distance of the screen is not suitable for continuous work.

Work/Rest Schedules

One solution for stress and fatigue is to design the computer operator's work so that tasks requiring concentrated work at the terminal are alternated with non-computer based tasks throughout the workday. Also, a short break (5-10 minutes) should be taken at least once each hour when involved in continuous work at the computer.

Other Solutions

Additional measures that will aid in reducing discomfort while working with VDTs include:

- Change position, stand up or stretch whenever you start to feel tired.
- Use a soft touch on the keyboard and keep your shoulders, hands, and fingers relaxed.
- Use a document holder, positioned at about the same plane and distance as the display screen.
- Rest your eyes by occasionally looking off into the distance.

Office Lighting

Different tasks require different levels of lighting. Areas in which intricate work is performed, for example, require greater illumination than warehouses. Lighting needs vary form time-to-time and person-to-person as well. One approach is to use adjustable task lighting that can provide needed illumination without increasing general lighting.

Task lamps are very effective to supplement the general office light levels for those who require or prefer additional light. Some task lamps permit several light levels. Since the individual controls task lamps, they can accommodate personal preferences.

Indoor Air Quality

Indoor air quality (IAQ) is an increasingly important issue in the work environment. The study of indoor air quality and pollutant levels within office environments is a complex

problem. The complexity of studying and measuring the quality of office environments arises from various factors including:

- Office building floor plans are frequently changing to accommodate increasingly more employees and reorganization.
- Office buildings frequently undergo building renovations such as installation of new carpet, modular office partitions and free-standing offices, and painting.
- Many of the health symptoms appearing are vague and common both to the office and home environment.
- In general, very little data on pollutant levels within office environments is available.
- Guidelines or standards for permissible personal exposure limits to pollutants within office buildings are very limited.

Many times odors are associated with chemical contaminants from inside or outside the office space, or from the building fabric. This is particularly noticeable following building renovation or installation of new carpeting. Venting the area from such things as paints, adhesives, sealants, office furniture, carpeting, and vinyl wall coverings is the source of a variety of irritant compounds. In most cases, these chemical contaminants can be measured at levels above ambient (normal background) but far below any existing occupational evaluation criteria.

Waste Disposal

Office personnel should carefully handle and properly dispose of hazardous materials, such as broken glass. A waste receptacle containing broken glass or other hazardous material should be labeled to warn maintenance personnel of the potential hazard.

Chemical Safety

Each office employee must be made aware of all hazardous materials they may contact in their work area. The *Hazard Communication Program* includes:

1. Written Program
2. Material Safety Data Sheets for each hazardous substance used
3. Specific safe handling, use and disposal
4. Employee Training

Emergency Action Plans

Emergency Action Plans are designed to control events and minimize the affects. Through careful pre-planning, establishment of Emergency Action Teams, training and drills, employees can be safeguarded and potential for damage to Company assets minimized.

Emergency Action Plans include:

1. Exits routes, meeting areas and employee accounting
2. Emergency evacuation, incident command and notification to emergency services
3. Personal injury and property damage
4. Protection of Company information, both hard copy and electronic media
5. Bomb threats and facility security
6. First Aid Response
7. Use of fire extinguishers

Emergency Action Team Members (for example, Supervisors, Receptionist/Telephone Operators, and key assigned members) should be trained with quarterly reviews and drills. Semiannual drills with all employees should be conducted to assure effectiveness. First Aid Kits or First Aid supplies should be available with trained First Aid Providers available.

Policy Number: SP320
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Storage of Flammable Materials

Purpose:

Proper Storage and use of flammable liquids can significantly reduce the possibility of accidental fires and injury to employees. To minimize risk to life and property, the requirements of NFPA 30 & 321 and OSHA Standard 1910.106 have been implemented. MSDS for flammable liquids are kept in the maintenance office and at each storage location.

Applicability:

The policy applies to all employees

Procedure:

Responsibilities

Management

- Provide proper storage for flammable liquids
- Ensure proper training is provided to employees who work with flammable liquids
- Ensure containers are properly labeled

Supervisors

- Provide adequate training in the use and storage of flammable liquids
- Monitor for proper use and storage
- Keep only the minimum amount required on hand
- Ensure MSDS are current for all flammable liquids

Employees

- Follow all storage and use requirements
- Report deficiencies in storage and use to supervisors
- Immediately report spills to supervisors

Hazard Control

Engineering Controls

- Properly designed flammable storage areas
- Ventilated Storage areas
- Grounding Straps on Drums and dispensing points

Administrative Controls

- Designated storage areas
- Limiting amount of flammable liquids in use and storage
- Employee Training
- Limited & controlled access to bulk storage areas
- Posted Danger, Warning and Hazard Signs

Definitions

Flammable Liquid - a liquid with a flashpoint below 100^0F

- Class IA - flashpoint below 73^0F and boiling point below 100^0F
- Class IB - flashpoint below 73^0F and boiling point above 100^0F
- Class IC - flash at or above 73^0F and below 100^0F

Combustible Liquids - a liquid having a flash point at or above 100^0 F.
Class II Combustibles - Flashpoint above 100^0F and below 140^0F
Class III Combustibles - Flashpoint at or above 140^0F

- Subclass IIIA - flashpoint at or above 140^0F and below 200^0F
- Subclass IIIB - flashpoint at or above 200^0F

Substitution

Relatively safe materials sometimes may substitute flammable liquids in order to reduce the risk of fires. Any substituted material should be stable and nontoxic and should either be nonflammable or have a high flashpoint.

Storage & Usage of Flammable Liquids

Flammable and combustible liquids require careful handling at all times. The proper storage of flammable liquids within a work area is very important in order to protect personnel from fire and other safety and health hazards.

- Storage of Flammable liquids shall be in NFPA approved flammable storage lockers or in low value structures at least 50 feet from any other structure. Do not store other combustible materials near flammable storage areas or lockers
- Bulk drums of flammable liquids must be grounded and bonded to containers during dispensing
- Portable containers of gasoline or diesel are not to exceed 5 gallons
- Safety cans used for dispensing flammable or combustible liquids shall be kept at a point of use.
- Appropriate fire extinguishers are to be mounted within 75 feet of outside areas containing flammable liquids, and within 10 feet of any inside storage area for such materials.
- Storage rooms for flammable and combustible liquids must have explosion-proof light fixtures
- Bulk storage of gasoline or diesel is kept in above ground tanks. Tank areas are diked to contain accidental spills. Tanks shall be labeled in accordance with IAW NFPA guidelines. All tank areas shall be designated no smoking - no hot work - no open flame areas.
- No flames - hot work or smoking is be permitted in flammable or combustible liquid storage areas.

1. The maximum amount of flammable liquids that may be stored in a building are:

    A) 20 gallons of Class IA liquids in containers
    B) 100 gallons of Class IB, IC, II, or III liquids in containers
    C) 500 gallons of Class IB, IC, II, or III liquids in a single portable tank.

- Flammable liquid transfer areas are to be separated from other operations by distance or by construction having proper fire resistance.
- When not in use flammable liquids shall be kept in covered containers.
- Class I liquids may be used only where there are no open flames or other sources of ignition within the possible path of vapor travel.
- Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or portable tanks within a building only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container or portable tanks by gravity through an approved self-closing valve.

Transferring by means of air pressure on the container or portable tanks shall be prohibited.

- Maintenance and operating practices shall be in accordance with established procedures, which will tend to control leakage and prevent the accidental escape of flammable or combustible liquids. Spills shall be cleaned up promptly.
- Combustible waste material and residues in a building or unit operating area shall be kept to a minimum, stored in covered metal receptacles and disposed of daily.
- Rooms in which flammable or combustible liquids are stored or handled by pumps shall have exit facilities arranged to prevent occupants from being trapped in the event of fire.
- Inside areas in which Class I liquids are stored or handled shall be heated only by means not constituting a source of ignition, such as steam, hot water or forced air systems located away from the area.

Cabinets

Not more than 120 gallons of Class I, Class II, and Class IIIA liquids may be stored in a storage cabinet. Of this total, not more than 60 gallons may be Class I and II liquids. Not more than three such cabinets (120 gallons each) may be located in a single fire area except in an industrial area.

Containers

The capacity of flammable and combustible liquid containers will be in accordance with the table below.

Maximum allowable capacity of containers and portable tanks

	Flammable Liquids		Combustible Liquids		
Container	1A	1B	1C	II	III
Glass or approved plastic1	1 pt[2]	1 qt[2]	1 gal	1 gal	1 gal
Metal (Other than DOT drums)	1 gal	5 gal	5 gal	5 gal	5 gal
Safety Cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal drums (DOT specifications)	60 gal	60 gal	60 gal	60 gal	60 gal
Approved portable tanks	660 gal	660 gal	660 gal	660 gal	660 gal
(1) Nearest metric size is also acceptable for the glass and plastic (2) One gallon or nearest metric equivalent size may be used if metal and labeled with their contents.					

Storage Inside Buildings

Where approved storage cabinets or rooms are not provided, inside storage will comply with the following basic conditions:

- The storage of any flammable or combustible liquid shall not physically obstruct a means of egress from the building or area.
- Containers of flammable or combustible liquids will remain tightly sealed except when transferred, poured or applied. Remove only that portion of liquid in the storage container required to accomplish a particular job.

If a flammable and combustible liquid storage building is used, it will be a one-story building devoted principally to the handling and storing of flammable or combustible liquids. The building will have 2-hour fire-rated exterior walls having no opening within 10 feet of such storage.

Flammable paints, oils, and varnishes in 1 or 5 gallon containers, used for building maintenance purposes, may be stored temporarily in closed containers outside approved storage cabinets or room if kept at the job site for less than 10 calendar days.

Ventilation

Every inside storage room will be provided with a continuous mechanical exhaust ventilation system. To prevent the accumulation of vapors, the location of both the makeup and exhaust air openings will be arranged to provide, as far as practical, air movement directly to the exterior of the building and if ducts are used, they will not be used for any other purpose.

Policy Number: SP330
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Tool Safety

Purpose:

Use of tools makes many tasks easier. However, the same tools that assist us, if improperly used or maintained, can create significant hazards in our work areas. Employees who use tools must be properly trained to use, adjust, store and maintain tools properly. This program provides guidelines for the safe use of hand, electrical, pneumatic, power driven, and hydraulic tools.

Applicability:

All employees required to use tools

Procedure:

Responsibility

Management

- Provide correct tools for assigned tasks
- Ensure tools are maintained and stored safely
- Provide employee training
- Provide for equipment repair

Employees

- Follow proper tool safety guidelines
- Report tool deficiencies and malfunctions
- Properly store tools when work is completed

Hazard Control

Engineering

- Properly designed tools
- Guards & safety devices

Administrative

- Tool sharpening program
- Use of PPE
- Control of tool issue
- Employee Training
- Controlled access to equipment and tool areas

General Safety Precautions

Employees who use hand and power tools and who are exposed to the hazards of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases must be provided with the particular personal equipment necessary to protect them from the hazard.
Following five basic safety rules we can prevent all hazards involved in the use of tools:

- Keep all tools in good condition with regular maintenance.
- Use the right tool for the job.
- Examine each tool for damage before use.
- Operate according to the manufacturer's instructions.
- Provide and use the proper protective equipment.

Hand Tools

Hand tools are non-powered. They include anything from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance.
Some examples:

- Using a screwdriver as a chisel may cause the tip of the screwdriver to break and fly, hitting the user or other employees.
- If a wooden handle on a tool such as a hammer or an axe is loose, splintered, or cracked, the head of the tool may fly off and strike the user or another worker.
- A wrench must not be used if its jaws are sprung, because it might slip.

- Impact tools such as chisels, wedges, or drift pins are unsafe if they have mushroomed heads. The heads might shatter on impact, sending sharp fragments flying.

Appropriate personal protective equipment, e.g., safety goggles, gloves, etc., should be worn due to hazards that may be encountered while using portable power tools and hand tools.

Floors shall be kept as clean and dry as possible to prevent accidental slips with or around dangerous hand tools.

Around flammable substances, sparks produced by iron and steel hand tools can be a dangerous ignition source. Where this hazard exists, spark-resistant tools made from brass, plastic, aluminum, or wood will provide for safety.

Power Tool Precautions

Power tools can be hazardous when improperly used. There are several types of power tools, based on the power source they use: electric, pneumatic, liquid fuel, hydraulic, and powder-actuated.

Power tool users should observe the following general precautions:

- Never carry a tool by the cord or hose.
- Never yank the cord or the hose to disconnect it from the receptacle.
- Keep cords and hoses away from heat, oil, and sharp edges.
- Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits and cutters.
- All observers should be kept at a safe distance away from the work area.
- Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting. The worker should not hold a finger on the switch button while carrying a plugged-in tool.
- Tools should be maintained with care. They should be kept sharp and clean for the best performance. Follow instructions in the user's manual for lubricating and changing accessories.
- Be sure to keep good footing and maintain good balance.
- The proper apparel should be worn. Loose clothing, ties, or jewelry can become caught in moving parts.
- All portable electric tools that are damaged shall be removed from use and tagged "Do Not Use."

<u>Guards</u>

Hazardous moving parts of a power tool need to be safeguarded. For example, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or moving parts of equipment must be guarded.

Guards, as necessary, should be provided to protect the operator and others from the following:

- Point of operation,
- In-running nip points,
- Rotating parts, and
- Flying chips and sparks.

Safety guards must never be removed when a tool is being used. For example, portable circular saws must be equipped with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it makes contact with the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.

Safety Switches

The following hand-held powered tools are to be equipped with a momentary contact "on-off" control switch: drills, fastener drivers, horizontal, vertical and angle grinders with wheels larger than 2 inches in diameter, disc and belt sanders, reciprocating saws, saber saws, and other similar tools. These tools also may be equipped with a lock-on control provided that turns off the tool by a single motion of the same finger or fingers that turn it on.

The following hand-held powered tools may be equipped with only a positive "on-off" control switch: platen sanders, disc sanders with discs 2 inches or less in diameter; grinders with wheels 2 inches or less in diameter; routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks ¼-inch wide or less.

Other hand-held powered tools such as circular saws having a blade diameter greater than 2 inches, chain saws, and percussion tools without positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

Electrical Safety

Among the chief hazards of electric-powered tools are burns and slight shocks, which can lead to injuries or even heart failure. Under certain conditions, even a small amount of current can result in severe injury and eventual death. A shock also can cause the user to fall off a ladder or other elevated work surface.

To protect the user from shock, tools must either have a three-wire cord with ground and be grounded, be double insulated, or be powered by a low-voltage isolation transformer. Three-wire cords contain two current-carrying conductors and a grounding conductor. One end of the grounding conductor connects to the tool's metal housing. The other end is grounded through a prong on the plug. Anytime an adapter is used to accommodate a two-hole receptacle, the adapter wire must be attached to a known ground. The third prong should never be removed from the plug.

Double insulation is more convenient. The user and the tools are protected in two ways: by normal insulation on the wires inside, and by a housing that cannot conduct electricity to the operator in the event of a malfunction.

Electric Power Tool General Safety Practices:

- Electric tools should be operated within their design limitations.
- Gloves and safety footwear are recommended during use of electric tools.
- When not in use, tools should be stored in a dry place.
- Electric tools should not be used in damp or wet locations.
- Work areas should be well lighted.

Powered Abrasive Wheel Tools

Powered abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments. Before an abrasive wheel is mounted, it should be inspected closely and sound- or ring-tested to be sure that it is free from cracks or defects. To test, wheels should be tapped gently with a light non-metallic instrument. If they sound cracked or dead, they could fly apart in operation and so must not be used. A sound and undamaged wheel will give a clear metallic tone or "ring."

To prevent the wheel from cracking, the user should be sure it fits freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place, without distorting the flange. Follow the manufacturer's recommendations. Care must be taken to assure that the spindle wheel will not exceed the abrasive wheel specifications.

Due to the possibility of a wheel disintegrating (exploding) during start-up, the employee should never stand directly in front of the wheel as it accelerates to full operating speed. Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of breakage.

<u>Powered Grinder Safety Precautions</u>

- Always use eye protection.
- Turn off the power when not in use.
- Never clamp a hand-held grinder in a vise.

Pneumatic Tools

Pneumatic tools are powered by compressed air and include chippers, drills, hammers, and sanders. There are several dangers encountered in the use of pneumatic tools. The main one is the danger of getting hit by one of the tool's attachments or by some kind of

fastener the worker is using with the tool. Eye protection is required and face protection is recommended for employees working with pneumatic tools. Working with noisy tools such as jackhammers requires proper, effective use of hearing protection.

When using pneumatic tools, employees are to check to see that they are fastened securely to the hose to prevent them from becoming disconnected. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard.

A safety clip or retainer must be installed to prevent attachments, such as chisels on a chipping hammer, from being unintentionally shot from the barrel.

Screens must be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.

Compressed air guns should never be pointed toward anyone. Users should never "dead-end" it against themselves or anyone else.

Powder-Actuated Tools

Powder-actuated tools operate like a loaded gun and should be treated with the same respect and precautions. In fact, they are so dangerous that only specially trained employees must operate them.
Powder-Actuated Tool Safety:

- These tools should not be used in an explosive or flammable atmosphere.
- Before using the tool, the worker should inspect it to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.
- The tool should never be pointed at anybody.
- The tool should not be loaded unless it is to be used immediately. A loaded tool should not be left unattended, especially where it would be available to unauthorized persons.
- Hands should be kept clear of the barrel end. To prevent the tool from firing accidentally, two separate motions are required for firing: one to bring the tool into position, and another to pull the trigger. The tools must not be able to operate until they are pressed against the work surface with a force of at least 5 pounds greater than the total weight of the tool.

If a powder-actuated tool misfires, the employee should wait at least 30 seconds, then try firing it again. If it still will not fire, the user should wait another 30 seconds so that the faulty cartridge is less likely to explode, then carefully remove the load. The bad cartridge should be put in water.

Suitable eye and face protection are essential when using a powder-actuated tool.
The muzzle end of the tool must have a protective shield or guard centered perpendicularly on the barrel to confine any flying fragments or particles that might

otherwise create a hazard when the tool is fired. The tool must be designed so that it will not fire unless it has this kind of safety device.

All powder-actuated tools must be designed for varying powder charges so that the user can select a powder level necessary to do the work without excessive force.

If the tool develops a defect during use it should be tagged and taken out of service immediately until it is properly repaired.

Powder-Actuated Tool Fasteners

When using powder-actuated tools to apply fasteners, there are some precautions to consider. Fasteners must not be fired into material that would let them pass through to the other side. The fastener must not be driven into materials like brick or concrete any closer than 3 inches to an edge or corner. In steel, the fastener must not come any closer than one-half inch from a corner or edge. Fasteners must not be driven into very hard or brittle materials, which might chip or splatter, or make the fastener ricochet.

An alignment guide must be used when shooting a fastener into an existing hole. A fastener must not be driven into a spalled area caused by an unsatisfactory fastening.

Hydraulic Power Tools

The fluid used in hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded.

Jacks

All jacks - lever and ratchet jacks, screw jacks, and hydraulic jacks - must have a device that stops them from jacking up too high. Also, the manufacturer's load limit must be permanently marked in a prominent place on the jack and should not be exceeded.

A jack should never be used to support a lifted load. Once the load has been lifted, it must immediately be blocked up.

Use wooden blocking under the base if necessary to make the jack level and secure. If the lift surface is metal, place a 1-inch-thick hardwood block or equivalent between it and the metal jack head to reduce the danger of slippage.

To set up a jack, make certain of the following:

- The base rests on a firm level surface,
- The jack is correctly centered,
- The jack head bears against a level surface, and
- The lift force is applied evenly.

Proper maintenance of jacks is essential for safety. All jacks must be inspected before each use and lubricated regularly. If a jack is subjected to an abnormal load or shock, it should be thoroughly examined to make sure it has not been damaged.

Hydraulic jacks exposed to freezing temperatures must be filled with an adequate antifreeze liquid.

Policy Number: SP340
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Asbestos Awareness

Purpose:

The purpose of this program is to provide information about asbestos, the potential health effects associated with exposure, and safety procedures that should be followed to reduce exposure and protect the health of employees.

Applicability:

All employees

Procedure:

The word asbestos is derived from a Greek word that means inextinguishable or indestructible. Asbestos is a naturally occurring mineral that is found throughout the world. Major deposits, however, are found primarily in the U.S., Canada, Russia, and S. Africa. Asbestos has several characteristics that make it desirable for many commercial uses. The fibers are extremely strong, flexible, and very resistant to heat, chemicals, and corrosion. Asbestos is also an excellent insulator, and the fibers can be spun, woven, bonded into other materials, or pressed to form paper products. For these reasons and because it is relatively inexpensive, asbestos has been widely used for many years and now is found in over three thousand different commercial products.

Exposure to asbestos fibers can cause serious health risks. The major risks from asbestos come from inhaling the fibers. Asbestos is composed of long silky fibers that contains hundreds of thousands of smaller fibers. These fibers can be subdivided further into microscopic filaments that will float in the air for several hours. Asbestos fibers can easily penetrate body tissues and cause disabling and fatal diseases after prolonged exposure.

Although exposure to asbestos is potentially hazardous, health risks can be minimized. In most cases the fibers are released only if the asbestos containing materials (ACM) is disturbed. Intact and undisturbed asbestos materials do not pose a health risk. The mere presence of asbestos does not mean that the health of occupants is endangered. When ACM is properly managed, release of fibers into the air is prevented or minimized, and the risk of asbestos related disease can be reduced to a negligible level. However, asbestos materials can become hazardous when they release fibers into the air due to damage, disturbance, or deterioration over time.

The ability to recognize the kinds of material that contain asbestos, knowing under what conditions they are dangerous, and understanding basic safety precautions, are all important in keeping exposures to a minimum.

TYPES

The term "asbestos" is a name that refers to six naturally occurring minerals. The three types most commonly used in buildings are chrysotile, amosite, and crocidolite. Chrysotile accounts for approximately 95% of the asbestos used in commercial products. Chrysotile is commonly called white asbestos because of its natural color. Amosite, known as brown asbestos, is the second most likely type found in buildings. It is hard to wet and therefore hard to control. Amosite is commonly found in boilers and pipes. The third type of asbestos is known as crocidolite. It is also know as blue asbestos or blue mud. Crocidolite is used in high temperature applications around pipes.

IDENTIFYING ASBESTOS

There are many substances that workers contact that may contain asbestos and have the potential to release fibers. Only rarely can asbestos in a product be determined from labeling or by consulting the manufacture. The presence of asbestos cannot be confirmed visually. The only way to positively identify asbestos is through laboratory analysis of samples. If the presence of asbestos is suspected always assume that it is an asbestos containing material and have it analyzed.

FRIABLE ASBESTOS

The potential for a product containing asbestos to release fibers depends on its degree of friability. Friable ACM can easily be crumbled or reduced to a powder by hand pressure, releasing fibers into the air.

The white fibrous or fluffy spray-applied asbestos material found in many buildings for fireproofing, insulating, sound proofing, or decorative purposes are friable. Friable ACM is found primarily in building areas not generally accessible to the public, such as boiler and machinery rooms. For example, asbestos insulation around pipes and boilers is considered friable.

Asbestos that is tightly bound with another material is considered non-friable and will only release fibers if sanded, cut, or broken. For example, ceiling tiles containing asbestos, and asbestos-cement pipe or sheets will not normally release fibers unless cut or broken. Vinyl asbestos tile is also considered non-friable and generally does not emit fibers unless sanded, cut, or sawed.

REGULATORY PROGRAMS

Both the EPA and OSHA control exposure to asbestos. EPA regulations are known as NESHAP (National Emission Standards for Hazardous Air Pollutants). These regulations specify control measures and work practices to reduce releases of asbestos into the environment. NESHAP regulations may require ACM removal before renovation and/or demolition projects to prevent significant asbestos releases into the air.

EPA has also implemented a separate regulation to handle asbestos materials used inside schools (grades K-12). This regulation is known as AHERA (Asbestos Hazards Emergency Response Act). The regulations require that all schools be inspected to determine the presence and quantity of asbestos. The type of corrective action such as removal, encapsulation, or maintenance in place is left up to the school.

OSHA regulations are designed to protect workers who handle ACM. OSHA has set standards for the number of fibers that a worker can be exposed to, called the permissible exposure limit (PEL). Current OSHA regulations have set a maximum workplace concentration limit of 0.1 f/cc measured as an 8-hour time-weighted-average. This is equivalent to approximately six fibers in a volume of air the size of a baseball. The time-weighted-average is calculated by dividing the total exposure for a workday by eight hours. Exposures over 0.1 f/cc are allowed as long as they are balanced by exposures under 0.1 f/cc. The standard includes requirements for respiratory protection, medical surveillance, and work practices to reduce indoor asbestos levels.

USES

Asbestos has been used for over three thousand years. There was very little use for asbestos until the start of the twentieth century when it was used as thermal insulation in steam engines. Since then it has been used in thousands of products. Consumption in the U.S. increased to a peak of 800,000 tons per year in the early 1970s. Because of health concerns, however, consumption has dropped by more than 70%.

Asbestos gained widespread use because it is plentiful, readily available, and low in cost. It has several properties that make it very desirable to industry such as fire resistance, high strength, poor heat and electric conductor, and resistance to chemicals. These properties have made it useful for electrical, acoustical, and thermal insulation and products that resist fire, friction, and chemicals.

Examples of these uses include automotive brake and clutch linings, floor and ceiling tiles, plastics, asbestos-cement pipes and sheets, paper products, textile products such as

curtains and gloves, and insulation for boilers and pipes. It is also present in sprayed-on materials located on beams, in crawlspaces, and between walls. The amount of asbestos contained in these products may vary from 1-100%.

Fireproofing

One of the most common uses for asbestos was as a fireproofing material. More than half of the large multi-story buildings constructed during 1950-1970 period contain some form of sprayed ACM. It was sprayed on steel beams and columns to prevent these structures from warping or collapsing in case of a fire. Asbestos comprised 5-95% of the fireproofing mixture. This mixture is soft and fluffy in appearance and to the touch and is considered very friable. The material may vary in color from white to dark gray and may have been painted or encapsulated with a sealant. Spray painting of asbestos was banned in 1978.

Insulating and Decorative Purposes

Sprayed or trowelled asbestos coatings generally have an asbestos content of 50-80%. The coatings were commonly applied to steel I-beams and decks, concrete ceilings and walls, and hot water tanks and boilers. The coatings were applied primarily for thermal insulation but also provided acoustical insulation and a decorative finish. Sprayed coatings typically have a rough fluffy appearance. Trowelled coatings have a smooth finish and may be covered with a layer of plaster or other non-asbestos material. Both sprayed and trowelled coatings are friable. Asbestos insulation board was used as a thermal/fireproofing barrier in many types of walls, ceilings and ducts or pipe enclosures. This material looks like A-C sheets but is less dense and much more friable.

Pipe Insulation

Pipe insulation for hot and cold water and steam pipes commonly contained asbestos. These coverings have an asbestos content of about 50%. This material is usually white and chalky and was typically manufactured in 3-ft long half round sections. The sections were joined around the pipe using plaster soaked canvas or metal bands. Asbestos pipe coverings are easily crumbled and are considered friable.

Boilers and Hot Water Tanks

Asbestos block insulation was used as thermal insulation on boilers, hot water heaters and heat exchangers. These blocks are usually chalky white, 2 inches thick, and 1-3 ft long. The blocks are held in place by metal wires or lath and are often wrapped in a plaster-saturated canvas. The insulation is friable and readily deteriorates in a high humidity environment or when exposed to water.

Cement Pipes and Sheets

Asbestos cement was used to form pipes and sheets. Asbestos-cement pipes have been widely used for water and sewer lines. It was also used for electrical conduits, drainage pipes, and ventilation pipes. Asbestos-cement sheets have been used primarily for roofing and siding. It is also used in cooling towers, laboratory tables and hoods, and electrical switching gear panels. Asbestos-cement products are dense and rigid with gray coloration. The asbestos in these products is tightly bound and does not release fibers to the air under normal use.

Building Materials

Asbestos is added to a variety of building materials to act as a binder and increase strength. It can often be found in concrete, concrete tile products, and plaster and may contain up to 50% asbestos by weight. These products are used in siding and roofing shingles, wall board, corrugated and flat sheets for roofing, cladding, partitions, and as pipes. Asbestos has also been added to asphalt, vinyl, and other materials to make products like roofing felts, exterior siding, floor tiles, joint compounds, and adhesives. Fibers in these products are usually firmly bound and are released if the material is mechanically damaged, for example by drilling, cutting, or sanding. Roofing shingles and siding may also show slow deterioration due to weathering.

Friction Products

Asbestos is used in brake and clutch linings on automobiles. In the past, asbestos linings accounted for up to 99% of the market. Although the asbestos is tightly bound, dust in a brake drum from worn linings contains high levels of asbestos. Non-asbestos brake linings have been developed and are replacing asbestos linings. Extreme care should be used when working on brake linings to ensure that the asbestos dust is properly contained.

Plastic Products

Asbestos was added to many plastic products for increased strength. For example, asbestos was added to vinyl and asphalt floor coverings, roof coatings, and some molded plastic products such as cooking pot handles. These products are usually tough and non-flexible. The asbestos is tightly bound and is not released under typical conditions of use. However, any sawing, drilling, or sanding may result in the release of fibers.

Paper and Textile Products

Asbestos fibers were also manufactured into many paper and textile products. Paper products containing asbestos include commercial insulating papers, gaskets, roofing materials, heat protecting mats and pads, filters, and tiles for walls and ceilings. Asbestos yarn is used to manufacturer fire resistant curtains, protective clothing, electrical insulation, thermal insulation, and packing seals. These materials may release fibers when cut or torn.

HEALTH HAZARDS

The increase in the use of asbestos resulted in a dramatic rise in asbestos related diseases among workers. At first, asbestos was not regarded as a health hazard because it has no taste or odor, often cannot be seen, and causes no immediate health effects. Health problems however, developed over time in exposed workers. It was not until the 1950s that asbestos received widespread attention as a potential health hazard. The diseases associated with asbestos did not appear for 20-40 years after the initial exposure, making it very difficult to confirm asbestos as the cause. However, overwhelming evidence now exists that exposure to airborne asbestos fibers is linked to several serious diseases.

Exposure to asbestos can cause disabling respiratory diseases and several types of cancer. The main routes of exposure are inhalation and ingestion. Asbestos fibers cannot penetrate the skin. Asbestos has been shown to cause asbestosis, lung cancer, mesothelioma, and cancer of the stomach and colon. The majority of people who died from asbestos exposure were exposed to very high concentrations of asbestos fibers at work and had little or no protection. These employees worked with asbestos regularly and for long periods of time. Examples include workers who held jobs in industries such as shipbuilding, mining, milling, and fabricating. Many of these workers were also smokers.

The most dangerous exposure to asbestos is from inhaling airborne fibers. The body's defenses can trap and expel many of the particles. However, as the level of asbestos fibers increase many fibers bypass these defenses and become embedded in the lungs. The fibers are not broken down by the body and can remain in body tissue indefinitely.

The Respiratory System

Since the primary health effects due to asbestos exposure are on the lungs, it is important to know how the respiratory system works. Air passes through the mouth and nose into the windpipe which splits into two smaller airways called the bronchi. The bronchi divide into smaller and smaller tubes which terminate into air sacs called alveoli. It is in these air sacs that oxygen is absorbed into small blood vessels and carbon dioxide passes out of the blood.

The lungs are surrounded by a thin membrane which looks like saran wrap. These membranes are very moist and slide easily across each other, but are difficult to pull apart. The linings are composed of cells known as mesothelia cells. Interaction of asbestos with these cells can result in a cancer called mesothelioma. If the linings are damaged, inhalation cannot occur properly.

The body has several mechanisms to filter the air we breathe. Large particles are trapped by the hairs in the nose. Smaller particles impact on the mucous coated walls of airway and are caught. The airway has hair-like linings (ciliated cells) which constantly beat upward. Dust particles caught in the mucous are swept upwards into the back of the mouth and swallowed. Cigarette smoking temporarily paralyzes these hair-like

projections preventing them from discharging the dust particles. This is one reason cigarette smokers who work with asbestos are at increased risk.

Particles reaching the tiny air sacs are engulfed by large cells called macrophages. However, because asbestos is a mineral fiber they are often unsuccessful. When this occurs the macrophages deposit a coating on the fiber and may form scar tissue around it.

Asbestosis

Asbestosis is a non-cancerous chronic respiratory disease caused by an accumulation of asbestos fibers in the lungs. The fibers cut the air sacs and cause scar tissue to form. Even after exposure to asbestos has stopped, scar tissue will continue to form around existing scar tissue and fibers in the lungs. The scarring reduces the capacity of the lung to take in air resulting in shortness of breath, coughing, and fatigue. As the disease worsens, shortness of breath occurs even at rest. In severe cases death may be caused by respiratory or cardiac failure.

Asbestosis is typically found in workers who have been exposed to large doses of asbestos over a long time. The greater the asbestos exposure the more likely asbestosis will develop. It may take 15-30 years for the disease to develop. Because the presence of asbestosis indicates that workers have been exposed to a large dose of asbestos, they are at greater risk for lung cancer.

Lung Cancer

Exposure to asbestos has been linked to an increased risk of lung cancer. Symptoms include a cough, chest pain, and blood-streaked sputum. The pain is usually felt as a persistent ache unrelated to the cough. Lung cancer has a latency period of 15-20 years. Exposure to asbestos and cigarette smoking combine to create a significantly higher risk of developing lung cancer than would be expected from each substance alone. A smoker exposed to asbestos may have 50-100 times the risk of developing lung cancer compared to a non-exposed non-smoker.

Mesothelioma

Mesothelioma is an extremely rare cancer of the thin membrane lining the chest and abdomen. Most incidences of mesothelioma have been traced directly to a history of asbestos exposure. Symptoms include shortness of breath, pain in the walls of the chest, or abdominal pain. Mesothelioma spreads very rapidly and is always fatal. It has a latency period of approximately 40 years. Mesothelioma is more likely to be found among workers who were first exposed to asbestos at an early age, such as in school.

Other Diseases

There are no known immediate effects associated with exposure to asbestos. There is no evidence that asbestos fibers can penetrate the skin. However, some workers have

experienced irritation and a rash from exposure. There is some evidence suggesting that swallowing asbestos fibers may cause cancers of the digestive tract and may be carried to other parts of the body after being absorbed into the bloodstream.

Risks Associated with Low-Level Exposure

Asbestos is a known hazard based on studies of asbestos workers and laboratory animals exposed to high doses. However, the risks associated with low level non-occupational exposure (e.g., an occupant of a building containing ACM) are not well established. Risks from low level exposure are based on extrapolation from workers exposed to high levels of asbestos and may not be reliable.

Based on a review of the literature EPA concludes that there is no safe or threshold level of exposure. Since asbestos fibers accumulate in the lungs, the risk of disease increases as exposure increases. Theoretically any exposure could result in an asbestos related disease. Although the risk at very low exposures may be negligible, measures to reduce exposure and the accumulation of fibers should be followed.

SAFE WORK PRACTICES- REDUCING EXPOSURE

Operations and Maintenance (O&M) Program

An Operation and Maintenance Program is designed to manage asbestos in place to safeguard the health of building occupants. This is accomplished by training, cleaning, work practices, and inspections to maintain ACM in good condition. Removal is often not the best course of action to reduce asbestos exposure. The O&M program is designed to prevent asbestos fiber release and control fiber releases if they occur. A well-run O&M program may be all that is necessary to control the release of fibers. Emphasizing the importance and effectiveness of a good O&M program is critical to putting the potential hazards of asbestos exposure in proper perspective. That effort centers on communicating the following five facts to employees:

1. Although asbestos is hazardous, the risk of asbestos-related disease depends upon exposure to airborne fibers. An individual must breathe asbestos fibers in order to develop an asbestos-related disease. How many fibers an individual must breathe are uncertain. However, at very low exposure levels, the risk may be negligible or zero.
2. The average airborne asbestos level in buildings is very low. Therefore, the health risk to most building occupants will be very low. An EPA study in 1987 found asbestos air levels in buildings to be essentially the same as levels outside. Based on that data, most building occupants (i.e., those unlikely to disturb ACM) appear to face only a very slight risk, if any, of developing an asbestos-related disease.
3. Removal is often not the best course of action to reduce asbestos exposure. In fact, improper removal can create a dangerous situation where none previously existed. Asbestos removals tend to elevate the airborne level of asbestos fibers in

a building. Unless all safeguards are properly applied, a removal operation can actually increase rather than decrease the risk of asbestos related disease.

4. EPA only requires asbestos removal during building demolition or renovation activities. This is done to prevent significant public exposure to airborne fibers.
5. EPA recommends a proactive, in-place management program whenever ACM is discovered. In place management does not mean "do nothing." It means having a program that reduces the release of asbestos fibers, and ensures that proper controls and cleanup procedures are implemented if fibers are released. If in doubt about the possibility of disturbing ACM during maintenance activities, adequate precautions should be taken to minimize fiber release.

Basic O&M procedures to minimize and/or contain asbestos fibers may include wet methods, HEPA vacuuming, area isolation, PPE, and avoidance of certain activities, such as sawing, sanding, and drilling ACM. The need for these practices varies with the situation. For example, removing light fixtures located near ACM may disturb the material and might involve the use of special cleaning, area isolation, and respiratory protection. Periodic emptying of a trash can near asbestos containing plaster may not disturb the material, so special work practices would be unnecessary.

ACM may readily release fibers into the air when certain mechanical operations are performed directly on it. For example, fiber release can occur when workers are drilling, cutting, sanding, breaking, or sawing vinyl asbestos floor tile. Maintenance or repair operations involving those actions should be eliminated or carefully controlled to prevent or minimize asbestos fiber release. Certain activities that occur near ACM can also cause damage which may result in asbestos fiber release. For example, maintenance and custodial staff may damage ACM accidentally with broom handles, ladders, and fork-lifts while performing other tasks. Activities performed near ACM should always be done in a way that minimizes fiber release.

The O&M program should include a system to control all work that could disturb ACM. The person requesting the work should submit a Job Request Form to the Asbestos Manager before any maintenance work is begun that could disturb ACM.

Informing Building Occupants and Workers

Owners should inform occupants and workers about the location of ACM and stress the need to avoid disturbing the material. Occupants should be notified because they are less likely to disturb the material and cause fiber release.

In maintenance areas (such as boiler rooms and equipment rooms) signs should be placed directly next to boilers, pipes, and other equipment to remind maintenance workers not to disturb the ACM. As an alternative, color coding can be used to identify ACM if all potentially exposed workers understand the coding system.

The information given to building occupants should contain the following points:

1. The location, condition of the ACM, and the appropriate response.
2. Asbestos only presents a health hazard when fibers become airborne and are inhaled. The mere presence of ACM does not present a health hazard.
3. Do not disturb the ACM.
4. Report any evidence of disturbance or damage of ACM to supervision.
5. Report any dust or debris that might come from the ACM or any changes in the condition of ACM to supervision.
6. Cleaning and maintenance personnel are taking special precautions to properly clean up any asbestos dust and to guard against disturbing ACM.
7. All ACM is inspected periodically and additional measures will be taken if needed to protect the health of building occupants.

General Safety Procedures

Everyone has probably been exposed to asbestos because it is so widely used. However, the health risks associated with asbestos are directly related to the amount and frequency of exposure. Decreasing exposure to asbestos will decrease the health risks associated with it. This can be done by following safe work practices and taking proper precautions.

The health risks associated with exposure to asbestos occur when it is disturbed and releases fibers into the air. To reduce exposure, it is important to know where asbestos is located and to minimize activities that will release fibers into the air. The potential for a particular form of asbestos to release fibers will depend on several factors including the degree of friability, wear, age, and location.

Exposure to asbestos fibers can be hazardous. The following general precautions will reduce exposure and lower the risk of asbestos related health problems:

1. Drilling, sawing, or using nails on asbestos materials can release asbestos fibers and should be avoided.
2. Floor tiles, ceiling tiles or adhesives that contain asbestos should never be sanded.
3. Use care not to damage asbestos when moving furniture, ladders, or any other object.
4. Know where asbestos is located in your work area. Use common sense when working around products that contain asbestos. Avoid touching or disturbing asbestos materials on walls, ceilings, pipes, ducts, or boilers.
5. All asbestos containing materials should be checked periodically for damage or deterioration. Report any damage, change in condition, or loose asbestos containing material to a supervisor.
6. All removal or repair work involving asbestos must be done by specially trained personnel. OSHA and EPA regulations are very specific about work practices and equipment required to work safely with asbestos. These requirements may include proper respirators, special enclosures, training, exposure monitoring, long term record keeping, and medical surveillance.
7. Asbestos should always be handled wet to help prevent fibers from being released. If asbestos is soaked with water or a mixture of water and liquid

detergent before it is handled, the fibers are too heavy to remain suspended in the air.

8. In the presence of asbestos dust above the PEL, the use of a respirator approved for asbestos work is required. A dust mask is not acceptable because asbestos fibers will pass through it. The use of respirators must be approved by the Safety Office.
9. Dusting, sweeping, or vacuuming dry asbestos with a standard vacuum cleaner will put the fibers back into the air. A vacuum cleaner with a special high efficiency filter (HEPA) must be used to vacuum asbestos dust.
10. If a HEPA vacuum is not used cleanups must be done with a wet cloth or mop. The only exception to this would be if the moisture presents an additional hazard such as around electricity.
11. Asbestos waste, including all clean up materials, must be sealed in a double 6-mil plastic asbestos bag and properly labeled before being disposed in an EPA approved landfill.

Remember, the mere presence of asbestos itself does not create a health hazard unless the material is disturbed and releases fibers to the atmosphere. Protect yourself and others by being aware of where asbestos is located, the dangers involved, and using common sense when working around ACM.

Safety Procedures for Housekeepers

Housekeepers and maintenance workers may come into close proximity to ACM during the performance of their job duties. During routine activities exposure to custodians is very low and does not pose a significant risk for the development of asbestos related disease. A recent study determined that custodians who performed routine activities in buildings that contained friable ACM were not exposed to airborne asbestos above the PEL.

If gradual deterioration or damage to ACM has occurred, asbestos-containing dust or debris could be present. Special cleaning practices should be used to collect residual asbestos dust. Routinely cleaning floors using wet methods is an example of one such practice. Custodial and maintenance workers should also identify and report areas that are in need of special cleaning or repair. Cleaning must be done properly because the use of improper techniques may result in widespread contamination, and increase air-borne asbestos fiber levels in the building. In addition, improper cleaning may cause damage to the ACM, thus releasing more airborne asbestos fibers.

Workers involved in cleaning up small quantities of asbestos dust must receive training in asbestos awareness. The following practices should be used:

1. Always use wet cleaning or wet-wiping practices to pick up asbestos fibers. Dry sweeping or dusting can result in asbestos fibers being re-suspended and should never be used.

2. Wet cloths, rags, or mops used to pick up asbestos fibers, should be properly disposed of as asbestos waste while still wet.
3. The use of special vacuum cleaners known as HEPA vacuums may be preferable to wet cleaning in certain situations. Never use a regular vacuum cleaner to clean up asbestos dust. Workers should wear proper PPE when changing HEPA filters. Waste must be disposed of as asbestos waste.
4. If ACM has been released onto a carpet it may be impossible to adequately clean the carpeted area. Consult with supervision prior to cleaning. Steam cleaning and HEPA vacuuming can be used. Proper respiratory protection may be necessary. This type of cleaning should be done after hours.

Asbestos Floor Tiles

The following procedures should be used when caring for asbestos containing floor tiles.

1. Sanding of asbestos containing floor tiles is prohibited.
2. Stripping of finishes shall be conducted using wet methods and low abrasion pads at speeds lower than 300 rpm. Do not perform dry stripping or overstrip the floor.
3. When high speed buffing is done, ensure that there is adequate sealer and finish on the floor. Always keep the machine moving.
4. Do not remove or attempt to repair loose floor tiles. Improperly removed asbestos containing floor tiles could result in the release of high levels of asbestos.
5. Report loose floor tiles to supervision immediately. Avoid running the machine over loose tiles.

Asbestos Fiber Releases

Special procedures are needed to reduce the spread of asbestos fibers after a release of fibers has occurred, such as the partial collapse of an ACM ceiling or wall. Depending on the severity of the release, an asbestos contractor may be needed to conduct the cleanup operation. If fibers are released through an incident, personnel should take the following steps to reduce asbestos exposure to occupants until trained asbestos personnel arrive:

1. Prevent access to the contaminated area if possible.
2. Shut and lock doors.
3. Report the damaged ACM to supervision.
4. Remain in the area to direct asbestos personnel to the site.
5. Do not attempt to clean up a release.

On occasion potentially large releases of asbestos fibers will occur. When this happens, supervision should be notified immediately. Supervision will notify the Asbestos Manager and the Safety Manager. They will conduct a joint evaluation of the release and determine what actions should be taken. A minor release episode is defined as three square or linear feet or less of friable ACM. A licensed asbestos contractor will be called

to clean up releases greater than three square or linear feet. If the release is minor specially trained in-house personnel may clean-up the release using the following procedures:

1. Secure the area and post signs to prevent unauthorized personnel from entering the area.
2. If fibers could enter the HVAC system the unit should be shut down and sealed.
3. Put on a half or full face respirator with HEPA cartridges.
4. Put on a tyvek suit and gloves.
5. Clean up loose asbestos with a HEPA vacuum, do not use a regular vacuum.
6. If a HEPA vacuum is not available, wet down the area with amended water (water in which a few drops of liquid laundry detergent have been added).
7. Place all trash into two 6-mil plastic labeled bags.
8. Wipe the area clean.
9. Properly dispose of waste.

SUMMARY

The following key points should be remembered:

1. Inhalation of asbestos fibers can cause asbestosis, lung cancer, and mesothelioma. These health effects were noted primarily in workers exposed routinely to very high levels of asbestos on their jobs.
2. The health effects from exposure to low-level amounts of asbestos fibers are not as well understood. Therefore, custodial/maintenance workers should exercise caution when working around ACM and try to minimize exposures.
3. Three naturally occurring asbestos minerals, chrysotile, amosite, and crocidolite, are commonly used in building products.
4. Asbestos became a popular commercial product because of its strength, heat resistance, corrosion resistance, and thermal insulation properties.
5. ACM is regulated by EPA, OSHA, the Consumer Product Safety Commission, and individual state and local agencies.
6. Friable ACM can be found in about 700,000 public and commercial buildings. Many areas where asbestos is found are not accessible to the general public.
7. Some common uses of asbestos included pipe/boiler insulation, spray-applied fireproofing, floor and ceiling tile, and cement pipe/sheeting.
8. Positive identification of asbestos requires laboratory analysis. Information on labels or visual examination is not sufficient.
9. Intact, undisturbed materials generally do not pose a health risk. Asbestos may become hazardous when damaged, disturbed, or deteriorated over time and release fibers into the air.
10. If you smoke and work around asbestos your risks for developing asbestos related disease dramatically increase.
11. Report all releases and damaged ACM to supervision. Do not attempt to clean up asbestos spills.

12. Contractors are required to follow strict OSHA and EPA regulations when removing asbestos. Construction debris may be present after the contractor has left. This material will be free of asbestos.
13. Always consult the Asbestos Management Plan to determine where ACM is located in your work area.

Policy Number: SP350
Effective Date: 6/1/2010
Revision: 1
Prepared By: JW
Authorized By: _____

POLICY

Policy:

Vehicle Safety and Fleet Policy

Purpose:

This program covers safe operation and maintenance of all company vehicles except those company vehicles regulated by the Interstate Commerce Commission or US Department of Transportation. Examples of vehicles covered include company-owned-or-leased passenger vehicles, pickup trucks, light trucks and vans that do not require a commercial driver's license for operation.

Applicability:

All employees entrusted with the operation of motor vehicles during the performance of company business.

Procedure:

- Only employees authorized by company management for specific company purposes will operate all company vehicles.
- Vehicles will be maintained in a safe condition at all times. In the event of an unsafe mechanical condition, the vehicle will be immediately placed out of service and the appropriate manager notified.
- Only qualified company vehicle mechanics or approved service facilities are permitted to perform maintenance on company vehicles.
- All vehicles will be operated, licensed and insured in accordance with applicable local, state and federal laws.
- All employees authorized to operate any company owned or leased vehicle will be included in the company random drug-testing program. Drug testing will always be required following a vehicle accident involving a company vehicle or a private vehicle while on company business.

- All authorized employees must possess a valid state driver's license for the class vehicle authorized.
- Authorized employees must have a driving record at least equal to that required for maintaining a commercial driver's license.

Responsibilities

Management

- Provide annual defensive-driver training for all employees authorized to operate company vehicles.
- Train authorized employees on vehicle inspection and accident procedures.
- Maintain company vehicles in a safe condition.
- Maintain active insurance policies on all company vehicles.

Supervisors and Leads

- Allow only authorized employees to operate company vehicles.
- Arrange for defensive driving training prior to initial authorization
- Maintain a list of authorized employees in their department.
- Arrange for required periodic maintenance checks on assigned vehicles.
- Immediately remove from service any vehicle with any safety defect.
- Not allow operation of any company vehicle by an authorized employee taking medication that warns of drowsiness.
- Establish a key control program for all assigned vehicles.

Authorized Employees

- Operate company vehicles in a safe, responsible manner and obey all traffic laws.
- Participate in driver-training programs.
- Ensure all vehicle occupants use seatbelts before moving the vehicle.
- Follow safe fueling procedures.
- Conduct a pre-use inspection before any first daily use.
- Immediately report any safety defects or vehicle problems.
- Report use of all prescription medication.

Vehicle Use

Company owned vehicles will be operated by qualified, licensed employees who have been authorized, by management, to operate a company owned vehicle, for company business only.

Driver Selection and Motor Vehicle Screening

Employees who are required to operate a company owned vehicle, for company business, must meet the following requirements

- 18 years of age to operate standard vehicles that do not require specialized licensing.
- 21 years of age to operate a vehicle that requires specialized licensing, such as a CDL.
- Hold a current, valid drivers license issued by the state of the employees residence, for a minimum of 2 years.
- No DUI/DWI convictions for past ten years.
- No more than 2 moving violations, 2 preventable accidents or 1 moving violation and 1 preventable accident in the past three years.
- Physically able to operate a vehicle in a safe manner, and in accordance with all applicable laws in the state in which the vehicle is being operated.
- Completion of driver safety and awareness training prior to intial use of company owned vehicle, and annually thereafter.

Prior to initial use of a company owned vehicle, or a personally owned vehicle used for company business, a motor vehicle record must be obtained to verify that the employee meets the requirements for acceptable driving performance. If the employee will continue to be required to operate a vehicle for company business as a part of their on-going responsibilities, the motor vehicle record for that employee will be checked on an annual basis to ensure that the employee continues to meet the requirements for acceptable driving performance.

Personally Owned Vehicles

If an employee is required to operate a personally owned vehicle while conducting company business, the following requirements apply:

- Employee must submit a copy of proof of insurance to their manager. Proof of insurance must include the name of the insurance company, policy number and a listing of coverage amounts. The minimum coverage required to operate a vehicle on public roads for auto liability insurance is a minimum combined single limit of $500,000 for bodily injury/property damage or a $250,000 per person $500,000 per occurrence bodily injury limit and $100,000 property damage limit. If a privately owned vehicle must be operated on a client facility, the minimum coverage requirements mandated by the client must be met before the privately owned vehicle can be operated on the client facility.
- Maintain current state vehicle inspections & registrations when required.
- Proof of insurance (copy of declaration page with company name and policy number) should be sent to corporate on an annual basis.
- License and Motor Vehicle Record check must be made on an annual basis per corporate criteria.
- No 'business use' exclusion must be made on the personal insurance policy.

Accident Record Keeping, Reporting and Analysis

All vehicle accidents must be reported immediately via phone, to the manager or supervisor who has responsibility for the damaged vehicle. Details of the accident are to be reported by completing the high-lighted sections of the Automobile Loss Notice and forwarding to the responsible manager for review. The responsible manager will forward this form to the Executive Assistant to the CFO and the Director of Safety.

All documentation pertaining to an automobile accident, such as the Automobile Loss Notice, copies of police reports, copy of other driver insurance information, pictures of damage sustained by all vehicles involved in the accident and any statements from eye-witnesses will be maintained in an accident file located at the Triangle Services corporate office in Valley Stream, NY.

All accidents will be reviewed by an accident review board, consisting of the Chief Financial Officer and the Director of Safety, as well as any other management team members that are deemed necessary to provide full analysis of each accident. Each accident will be reviewed to determine the following:

- The cause of the accident, including all external factors,

- If the accident was preventable,
- If changes to the driver safety training can be made to make drivers more aware of the factors that led to the accident,
- If the driver involved in the accident remains qualified and is deemed capable of continuing in duties that require the operation of a vehicle for company business.

Training

All employees authorized to operate company-owned-or-leased vehicles will participate in initial and annual driver-safety training that will include:

- Defensive driving
- Vehicle inspection
- Accident procedures
- Hazardous weather driving
- Procedure for notification of unsafe vehicle
- Backing procedures (light truck & van operators)
- Cargo area storage (light truck & van operators)
- Loading & unloading (light truck & van operators)

All training will be documented safety form SF190 and maintained in the employees personnel file.

Vehicle Inspection

Vehicle inspections will be completed in accordance with safety form SF130, and in the frequency stated in table VS-1. Completed inspection forms are to be forwarded to the manager/supervisor responsible for that vehicle. The responsible manager/supervisor is required to organize and file the forms for inspection upon request.

Table VS-1

VEHICLE OPERATION	**REQUIRED INSPECTION FREQUENCY**
Vehicle operated on public roads	Daily, prior to use
Vehicle operated mostly on work site, but occasionally on public roads	Weekly while on work site and prior to use when operated on public roads
Exclusively on work site	Weekly

Mechanical Inspections - Every company vehicle will be inspected by a qualified vehicle mechanics at least every 3 months. Inspection & maintenance points include:

- Road test
- Visual inspection of brake system - wheel removal required
- Fluid system levels & visual inspection
- Brake pad wear
- Belts & hoses
- Battery condition
- Filter replacement
- Lubrication
- Oil change
- Emissions systems visual inspection
- Tire treads
- The Site Manager will maintain all vehicle inspections and maintenance records

Driving Safely

Starting

- Conduct pre-use inspection
- Use seatbelts at all times
- Adjust seat & mirrors before starting vehicle
- Allow a 15 second warm up time
- Check for warning lights

Driving

- Do not drive if drowsy
- Think ahead - anticipate hazards
- Don't trust the other driver to drive properly
- Don't speed or tailgate
- Drive slower in hazardous conditions or hazardous areas
- Pass only in safe areas and when excessive speed is not required

- No loose articles on floor
- Do not read, write, apply make-up, drink, eat or use a phone while driving
- Stay at least four seconds behind the vehicle ahead
- Do not stop for hitchhikers or to provide roadside assistance

Backing

- Back slowly & be ready to stop
- Do not back up if anyone is in path of vehicle travel
- Check clearances
- Don't assume people see you
- Getting out & check if you cannot see from the driver's seat

Stopping

- Park only in proper areas, not roadsides
- Use warning flashers & raise hood if vehicle becomes disabled

Accidents

- Do not admit responsibility
- Notify your company and law enforcement as soon as possible
- Cooperate with any law enforcement officers
- Move the vehicle only at the direction of a law enforcement officer
- Fill out all sections of the accident report in the glove box
- Do not sign any forms unless required by a law enforcement officer

At the scene get the following information:

- Investigating officer name and law enforcement agency
- Make, Model & License Plate number of other vehicles
- Names, addresses and phone numbers of all witnesses
- Photos of accident using camera in glove box
- *All 4 sides of all vehicles*
- Roads and intersection at the scene

- Interior of all vehicles - seating & floor areas
- Name, address, license number and insurance information of other drivers

SECTION III: FORMS

Form #	Form Description
SF001	Safety Manual Review Acknowledgement
SF020	Internal Safety Inspection
SF021	Regional/Executive Manager Safety Inspection
SF022	Formal Safety Audit
SF023	Certification of Safety Deficiency Correction
SF100	Occupational Injury Report and Investigation Form
SF105	Formal Accident Investigation Form
SF110	Vehicle Loss Report
SF120	General Liability Report
SF130	Vehicle Inspection Form
SF140	New Hire Orientation - Mechanical
SF150	New Hire Orientation – Janitorial
SF160	New Hire Orientation – Ramp
SF170	New Hire Orientation – Passenger Services
SF180	New Hire Orientation – Security
SF190	Safety Training Certification Form
SF200	Certification of Site Hazard Assessment
SF300	Energized Electrical Work Permit
SF310	Certification of Training: Qualified Electrical Worker
SF320	Qualified Electrical Worker Certification Card
SF400	Operational Check Policy Acknowledgement
SF430	Hand Protection Policy Acknowledgement
SF500	Job Hazard Analysis Form

Form Number: SF001
Effective Date: 6/1/2010
Revision: 2
Prepared By: JW
Authorized By: _____

EMPLOYEE ACKNOWLEDGEMENT
SAFETY MANUAL

I have reviewed the Triangle Services Corporate Safety Manual and the Site Specific Safety Handbook for my worksite. I will familiarize myself with the General Safety Rules and Safety Disciplinary Policy and will comply with all the provisions. I understand and agree that the Company has the right to change, amend, modify, or withdraw any provision of the General Safety Rules and Safety Disciplinary Policy without notifying me prior to the effective date of any amendment, modification, or withdrawal.

I understand that this is not a contract of employment and the Company has the right to follow or deviate from the policies in the General Safety Rules in the Company's sole and exclusive discretion. I also understand that the General Safety Rules plan does not change the nature of my "at–will" employment and I can be terminated with or without cause, with or without notice, at any time, at the option of either myself or the Company.

By my signature below, I agree to follow the policies and procedures contained in the Triangle Services Corporate Safety Manual and the Site Specific Safety Handbook and understand the terms of this Agreement.

_____ _____
Employee Signature Date

_____ _____

Print Employee Name

Site Location

_____

Site Manager

_____

Date

CC: Personnel File

Form SF600, Rev 1, 6/2010

Acknowledgement of Receipt of Hazard Communication Training

My signature below acknowledges that I have received training concerning Hazard Communications. I understand that this training fulfills the employee training requirement of OSHA's Hazard Communication Standard.

The jobsite and classroom training included the following:

1. Understanding the purpose and scope of the OSHA Hazard Communication Standard.

2. Explanation of the existence of federal, state and local right-to-know laws.

3. Definition of the classification "hazardous chemical".

4. Explanation of situations and elements that must be present for a material to be considered a health hazard.

5. Explanation and interpretation of labels, what is required on all containers, and the Hazard Materials Identification System (HMIS).

6. Understanding and interpretation of Material Safety Data Sheets (MSDS), which must be obtained for each hazardous chemical.

7. My responsibilities as an employee of Triangle Services.

8. Policies and procedures to follow in case of exposure.

_____

EMPLOYEE NAME (Please print)

_____

EMPLOYEE SIGNATURE DATE

_____

COMPANY REPRESENTATIVE DATE